



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Alice H. Howe

TENNIS RACQUET EQUIPPED  
WITH A TENNIS BALL RETRIEVER

Attorney Docket No.: MPH 99-46

Application No: 09/655,743

Art Unit 3711

Examiner: Raleigh W. Chiu

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Commissioner for Patents and Trademarks  
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**APPELLANT'S APPEAL BRIEF**

Appellant's Appeal Brief for the captioned Application is submitted herewith pursuant to the Notice of Appeal mailed on behalf of Appellant to the Assistant Commissioner for Patents on May 16, 2002.

**Real Party in Interest**

The Real Party in Interest is the Appellant, Alice H. Howe.

**Related Appeals and Interferences**

There are no related appeals or interferences to this Appeal.

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**Status of Claims**

Claims 1-7, 9, 10 and 12 stand finally rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 4,834,393 (referred to herein as "*Feldt*") or French Patent No. 2,594,037 (referred to herein as "*Musslin*") and either in view of U.S. Patent No. 5,077,870 (referred to herein as "*Melbye*") and what is referred to "as Appellant's admission of prior art in his specification".

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Claims 8, 11 and 13-15 stand finally rejected under 35 USC 103(a) as being unpatentable over *Feldi*, *Musslin*, *Melbye* and Appellant's alleged admission of the prior art in his specification in view of U.S. Patent No. 4,993,712 (*Urwin*).

#### **Status of Amendments**

All amendments to the Claims had been duly entered by the Examiner prior to the final rejection and this Appeal.

#### **Summary of Invention**

Prior to Appellant's invention, there existed no ball retrieving attachment which could be utilized (without damage to the tennis ball nap) to tangentially engage the pile of all tennis balls merely upon tangential contact and would allow the tennis ball to be repetitively lifted. The prior art solutions included cupping the tennis ball (e.g. *Urwin*), use of metallic hooks or barbs, or completely change the tennis ball covering to a non-conforming looped or hooked material pile (e.g. *Feldi*) cover so as to allow the ball (not a tennis ball by definition) to be retrieved with the paired hook and loop fastening system combination in its intended form of usage.

Tennis is a sport requiring the skillful dexterity and manipulation of a tennis racquet so as to impart the precise impacting speed, spin and positioning of the tennis racquet so as to create a ball flight most difficult for the opposing player to return. Tennis racquets are accordingly engineered and designed to provide a perfectly balanced racquet which allows the tennis player to precisely manipulate and position the tennis racquet to the exact strike zone for striking and returning the tennis ball. Any imbalance in the tennis racquet will be readily reflected in an errant or poor tennis ball flight.

The shot of the tennis ball player necessitates not only that the racquet be perfectly balanced, but also that whatever attachment may be used as a ball retriever that it will not create added unbalanced weight (where fractions of an ounce is critical) or in its design disrupt the aerodynamics of the racquet and its ability to slice through the air with a minimum of resistance without any appreciable air drag. These factors are essential in order for any tennis racquet to

create desired ball impacting speed, spin upon the impacted ball, positioning of the racquet, the balance of the racquet, the touch, the weight of the racquet, and a host of other factors attributable to an effective striking of the tennis ball and tennis play. Appellant's invention preserves all of these attributes, while also providing the unique ability to engage and repetitively lift all major tennis ball brands merely by tangential contact.

The art of record (including those cited by the Examiner in the Final Rejection) clearly reflects the unexpectedness of Appellant's invention, as a whole, especially when viewed in light of prior art documents which teach and suggest that what the appellant has accomplished herein by her invention was unobtainable under the cited prior art teachings.

Appellant's claimed invention involves an unexpected discovery that an unknown tennis ball retrieving attachment 30 has a uniquely distinctive ability for engaging and lifting all major tennis ball brands upon tangential contact (claim 1, lines 2-3; claim 10, line 4; Figures 2B and 4; and page 5, lines 1-10). As pointed out in Appellant's background of the invention, the prior art had recognized early that hooked materials were incapable of tangentially hooking onto the nap of conventional tennis balls (e.g. see specification on page 1, line 5 thru page 4, line 10). As a result, the prior art sought alternatives such as to graspingly cupping the tennis ball, (as taught by *Urwin*) or, alternatively, as the cited *Feldi* patent teaches, to completely replace the tennis ball cover with either the loop or hooked material of the paired hook and loop fastening system so that then the other mating member of the paired hooked and looped fastening system would fasten together in their customary manner and permit the ball to be lifted. Unfortunately, these "solutions" result in altering the tennis equipment so that it no longer effectively functions in its intended manner or meets the standards of identity of required tennis equipment. The bulky cupping attachments as suggested by *Urwin* affect the player's swing and performance with the tennis racquet. Changing the ball cover also alters its performance. Changing the tennis ball cover to either a hook or loop material alters the ball so that the ball no longer meets the standard of identity of a tennis ball.

Appellant's unique and unexpected discovery overcomes a perplexing problem heretofore unsolved. There existed no teachings of any known ball retrieving attachment 30 equipped with a

nylon monofilament hooked material **31** which could be attached to tennis racquet shoulder **11** and engage a tennis ball nap **N** simply upon tangential contact (see Fig. 2B), much less lift; and even more unexpectedly (i.e. the invention as a whole) to work with repetitive consistency upon all major tennis ball **T** brands when, in fact, the prior art repeatedly acknowledged its futility and sought alternative modes of operation to solve this perplexing problem. Nothing in the prior art of record remotely teaches or suggests these unobvious claimed embodiments of Appellant's invention, much less the unexpected accomplishment of Appellant's claimed invention.

The tennis ball retrieving attachment **30** is not only surprising capable upon tangential contact to lift all major brands, but will lift all major tennis ball **T** brands which are weighted four to six fold their original weight, as reported in Table 1, page 13 of Appellant's specification. This is an amazing feat since the prior art as shown by the record considered tangential lifting without damage to the tennis ball to be unfeasible (e.g. see appellant's background of the invention disclosure, *Urwin* and *Feldi*). The Table 1, 2 and 3 findings on pages 13 and 14 of Appellant's specifications document Appellant's findings.

Appellant's invention is directed towards an unknown tennis ball retrieving attachment **30** adhesively affixed to a shoulder **11** of a tennis racket **1** in a tangential contacting ball retrieving position (such as illustrated in Figures 1, 2A, 2B and 6; and described on page 5, lines 4-12; page 6, lines 21-25; page 7, lines 19-20; page 8, lines 7-16) for repeatedly engaging and lifting a grounded tennis ball **T** simply upon tangential contact with the tennis ball **T** as shown in Appellant's Figures 2B and 4. The unique unknown tennis ball retrieving attachment **30** is equipped with an atypical and a narrowly defined, one-of-a-kind, hooked pre-shrunk nylon monofilament material **31** which when adhesively attached as a strip to the convexed rimmed portion **12** of tennis racquet shoulder **11** allows the hooked material **31** to only make tangential contact with the grounded tennis ball **T**. The manner in which the tennis ball retrieving attachment **31** is positioned upon the tennis racquet shoulder **11** allows for only tangential contact with a grounded tennis ball **T** as illustrated via Figures 2B, 4 and 6-7 2B.

The distinctively different attachment **30** equipped with the (one of a known kind) claimed preshrunken monofilament hooked material **31** is characterized by its uniquely distinct features as “having a series of preshrunken nylon monofilament hooks” **31** of a prescribed characterization for engaging and lifting the grounded tennis ball **T** upon tangential contact with the hooks **31**. The unique attachment **30** is further qualified by these distinctive hooks **31** of a prescribed physical characterizations (with reference to Figure 5) “as having an average monofilament diameter **d** greater than 8.0 mil and an average hook height of at least 1.70 mm.” (e.g. see claim 1, lines 8-9, first three columns, Table 3, page 9, lines 6-17.)

The method claims 10-15 similarly tightly define the distinctively unique ball retrieving attachment **30** as providing a strip of a hooked material **30** having a pressure sensitive adhesive **33** applied to a resilient backing member equipped with a plurality of hooks **31** (claim 10, step a) of the very narrowly defined unique and distinctive hooked character (e.g. see page 9, line 5; page 10, line 10; Tables 2 and 3; and Figures 3-5) of:

- “an average monofilament diameter **d** of at least 8.0 mil,”
- “an average hook height **h** of at least 1.85 mm,”
- “an average hook width **w** of at least 1.0 mm,”
- “an average depth **H<sub>d</sub>** of at least 0.6mm,” and
- “with the hooks **31** being of a spiral configuration and arranged in repetitive rows of at least 250 hooks per square inch as depicted in Figures 4 and 7;

An integral part of the method claims involves characterization of providing a tennis ball retrieving attachment **31** of an unknown tennis ball retrieving efficacy which will allow for tangential retrieval of a tennis ball. This Method of Claimed claims 10-15 including the step of applying the pressure sensitive strip **30** (unknown for its compatibility and affinity to the nap **N** of a tennis ball **T**) to the outer peripheral rim **12** of the shoulder **11** of the tennis racquet **1** at the retrieving position so as to permit the distinctive nylon monofilament hooks **31** of the hooked material **30** to make the tangential contact with the grounded tennis ball **T** (claim 10, step b) are untaught and unsuggested by the art. The method claims 10-15 distinctly require tangentially

contacting the grounded tennis ball **T** (as shown in Figure 2B) with the nylon monofilament hooks **31** of said hooked material **30** so as to tangentially engage and hook a tennis ball **T** nap **N** (as illustrated in Figure 4) of the grounded tennis ball **T** onto said nylon monofilament hooks **31**; then lifting the hooked tennis ball **T** engaged by the nylon monofilament hooks **31** with the tennis racquet **1**; and retrieving the lifted tennis ball **T** from the strip.”

The claimed monofilament hooks **31** characterization of the tennis ball retrieving attachment **30** of all the claims 1-15 are uniquely distinctive in physical attributes, function and the unexpected results of yielding a saliently unique ability to repetitively engage, lift and retrieve all major tennis balls upon tangential contact with a tenacity equal to four to six times the weight of the tennis ball **T** (e.g. see Table I). The claims encompass a one-of-a-kind ball retrieving attachment **30** amongst a host of others and known only by the inventor, which was found to possess these unique characteristics. No other attachment equipped with any other hooked monofilament material is known to fulfill this unique property, function, or result. No prior art teachings recognized the existence of those essential prerequisite compositional and physical characteristics of appellant’s attachment **30** equipped with an isolated, one-of-a-kind pre-shrunk nylon monofilament hooked material **31** essential to the uniquely different and claimed tennis ball attachment **30** of Appellant’s claimed method claims 10-15, on those characterizations which uniquely and distinctively have the sole heretofore unknown capacity to repetitively engage and lift all major tennis balls simply upon tangential contact.

The unique tennis ball retrieving attachment **30** including the discovery of providing an attachment **30** fulfilling the necessary retrieving requirements and compatibility, the unexpected efficacy and comparative data illustrating what works and what does not work (e.g. see page 8, line 17 to page 16, line 12) including the comparative studies of Appellant’s Example and an understanding as to the operable mechanics of the ball attachment **30** constitute solely Appellant’s contribution to the art.

The patent literature includes scores of patents directed towards a host of manufacturing processes capable of producing a myriad of different paired hook and loop fastener combinations

(designed for paired use as a hook and loop fastener combination, as pairingly illustrated by Appellant's Figure 3)<sup>B</sup>. The hook and loop fastener industry is a well-established industry supported by scores of manufacturers and distributors producing a host of different products, many of which are often sold by their manufacturers under some brand name or label (e.g. such as SCOTCHMATE or VELCRO) but often differ vastly in their composition, function and structural make-up<sup>C</sup>. A common feature of all hook and loop fastening systems is that they are all specially manufactured for paired use as a mating of a two-component fastening system designed especially to cooperatively interlock and fasten together, as illustrated by Applicant's Figure 3. The paired hook and loop fastener systems are neither designed nor intended for separate unpaired use. The paired hook and loop fastener combination may be provided as flexible strips with adhesive backings as shown in Figure 3 which allow the mating hook and loop combination to be placed upon a suitable substrate in an interfacing and interengaging relationship.

Contrary to the prior arts understanding, Appellant discovered that a rare and isolated tennis ball retrieving attachment 30 equipped with nylon monofilament hooked material 31 of a very precise dimensional structure with atypical compositional and physical characteristics which when applied as a tennis ball retrieving attachment to a tennis racquet shoulder 12 would have the unknown and unreported capability of repetitively retrieving all major tennis balls T upon tangential contact while all others failed. It could not only tangentially lift all brands, but could lift several fold (e.g. four to six times) its own weight (e.g. see Tables 1 and 2). The unexpected nature of this discovery is verified by the art of record (which clearly teaches the unfeasibility or futility of such an accomplishment), the comparative results as disclosed in Appellant's example and verified by Appellant's Affidavit of Record<sup>D</sup>. The discovery made by the Appellant is analogous to finding a "needle in the haystack" without any knowledge that such a needle existed and even more astounding, what could be accomplished by Appellant's unique invention.

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<sup>B</sup>Exhibit B of Appendix

<sup>C</sup>Exhibit C of Appendix

<sup>D</sup>Exhibit D of Appendix

Appellant discovered that the preshrunk nylon monofilament hooked material **31** of the ball retrieving attachment **30** possessed highly specialized compositional and macroscopic physical characteristics which when attached to a tennis racquet **1**, **will** effectively tangentially hook and lift all major brands of tennis balls. The uniquely distinctive attachment **30** (as illustrated by Appellant's Figure 5 shown in Table 3, page 4 and as claimed in all claims) uniquely penetrates the tennis ball nap **N** or pile, effectively hooks onto a sufficient number of pile **N** threads (as illustrated in figure 4) and then tenaciously retains the threads **N** in a uniquely cooperative inter-relationship as the tennis ball **T** is lifted off the ground (e.g. see specification page 8, line 17; page 10, line 10; and Tables 1-3 of pages 13 and 14.) The tennis player merely detaches or unfastens the tennis ball **T** from the attachment **30**, thus eliminating the need to bend over and manually retrieve the ball from the ground. This is any unexpected relationship since the construction of the relatively rigid loop component is unlike the soft, pliable and flexible fibrous character of the wool nap **N** of the tennis ball **T**.

Appellant's tennis ball attachment **30** exhibits upon tangential contact to lift about a four-fold ball weight capacity all major tennis ball brands, which is unexpectedly and astoundingly high (e.g. see Tables 1 and 2, page 14), with Appellant commenting on page 14, lines 30-31, that only the precisely claimed ball retrieving attachment **31** was capable of consistently hooking and lifting all major tennis ball brands.

Unlike changing the tennis ball to the paired hook and loop fastening system of *Feldi* or the grasping tennis ball retrieving attachment curved to match a tennis ball curvature, such as taught by *Urwin*, Appellant unexpectedly discovered a unique tennis ball retrieving attachment **30** which (unlike all others) would simply upon tangential contact tenaciously hook and lift any tennis ball pile **N** of the tennis ball **T** from the ground. All other nylon hooked materials known to the Appellant which (pursuant to Appellant's discovery) failed to possess the precise hook depth  $H_d$ , hook width  $w$ , hook height  $h$ , and hook diameter  $d$  were found to be incapable upon tangential contact to effectively engage and tenaciously lift all major brands of tennis balls. Prior to Appellant's invention, no one knew or recognized that such a tennis ball retrieving attachment **30**



existed or that such a feat could be accomplished or what would be required to achieve such a phenomenal result in the face of consistent prior art teachings that it could not be done.

The claimed hooked materials **31** of Appellant's claimed ball retrieving attachment **30** are uniquely processed (e.g. see pages 8-16; Figure 5 and Table 3, page 14) so as to produce an unusually thicker monofilament hook **31** thickness (e.g. at least 8.5 mm in diameter), pre-shrunk so as to create unique dimensional stability and flatness so as to tenaciously retain the hooked fibrous pile **N** of tennis ball **T** and permit the tennis ball **T** to be repetitively lifted from the ground. These uniquely distinctive hooks **31** also have an unusually deeper than average hook depth (at least 0.65 mm) so as to permit deeper penetration of the hooks **31** so as to permit a more tenacious retention of fibrous pile **N** hooked by the hooks **31**, the average hook width **w** of about 1.1 mm to about 1.3 mm allows more space for the pile fibers **N** to be hooked by the hooks **31**. The average height of the hooks is also significantly greater (at least 1.85 mm) from all other tested hooks which reflects in its deeper penetration into the pile of tennis ball and greater quantum of fibrous pile **N** to be potentially hooked and retained by the hooks **31**. The tennis ball retrieving attachment **30** must necessarily contain a sufficient number of individual hooks **31** so as to effectively hook and lift all major brands of tennis balls **T** of a unique ball retrieving attachment **30**. A tennis ball retrieving attachment **30** possessing a unique cooperative interrelationship between hook height **h**, hook diameter **d**, hook width **w**, hook depth **H<sub>d</sub>** and the tennis ball nap **N** which allows the attachment **30** to engage and lift all major tennis balls **T** on tangential contact was Appellant's discovery alone. **NO OTHER** known ball retrieving attachment amongst a host of potentially different products possess this unique capability. No other person, reference or patent disclosed, recognized or remotely contemplated the unique set of cooperative characteristics of a ball retrieving attachment **30** which would permit a tennis ball attachment **30** to tenaciously engage onto the tennis ball nap **N** and lift the tennis ball **T** upon tangential contact. As shown by the art of record, no one could heretofore accomplish this feat.

The invention, as a whole, embodies the heretofore unachievable ability to repetitively engage (without fail) and retrieve all major tennis ball brands upon tangential contact with the

tennis ball nap N with an attachment 30 attached to the shoulder 12 of a tennis racquet. This has not heretofore been reported, and was expressly regarded amongst the skilled artisans as impossible (as evident from the cited patents and Appellant's summary of prior art in her background of invention teachings), and therefore attached the attachment 30 and its use yields surprising and unexpected results.

### Issues

#### I

Whether Claims 1-7, 9, 10 and 12 are patentable under 35 USC 103(a) over the *Feldi* or *Musslin* patents and either in view of *Melbye* and Appellant's alleged admission of the prior art.

#### II

Whether Claims 8, 11 and 13-15 are patentable under 35 USC 103(a) over *Feldi*, *Musslin*, *Melbye* and Appellant's alleged admission of the prior art in view of US Patent No. 4,993,712 of *Urwin*.

#### III

Whether *prima facie* obviousness of the claimed invention of Appellant's claims 1-15 may be established when the essential claimed limitations of Appellant's claims 1-15 are neither taught nor suggested by any of the prior art relied upon in the 35 USC 103(a) rejections?

#### IV

Whether in the rejection of Appellant's claims 1-15 equivalency may be presumed 35 USC 103(a) when Appellant's specifications, claims and affidavit evidence, as well as the cited art, shows without contradictory proof that what the Examiner alleges to be equivalent is not equivalent?

#### V

Whether in the rejection of Appellant's claims 1-15 under 35 USC 103(a) rejection, the doctrine of equivalency resting upon the basis of strictly a mating combination of paired hook and loop fastening systems as taught and intended by *Feldi* and *Melbye* for conjoint or paired use may be hypothetically extended to include only one component of the required paired two-component

fastener system combination coupled with a speculatively equivalency extension so as to include an unknown and unrecognized combination of a tennis ball nap and a uniquely different tennis ball retrieving attachment equipped with a saliently different and unique hooked monofilament material?

## VI

Whether in the rejection of Appellant's claims 1-15 under 35 USC 103(a) a primary reference (patents) or secondary reference (patents), or both, may be modified by other patents relied upon in a reference combination of patents so as to render the primary or the secondary reference or both inoperative for their intended purpose and function, as applied in the 35 USC 103(a) rejection of Appellant's claims?

## VII

Whether in 35 USC 103(a) rejection and analysis of Appellant's method claims 10-15, a *prima facie* case of obviousness may be deemed to exist when crucial claimed characteristics are neither taught nor remotely recognized by the art relied upon, the art relied upon contradicts the embodiments of Appellant's claimed invention, the art relied upon fails to motivate the artisan in the direction of Appellant's claimed invention of claims 10-15, the tennis racquet attachment and tennis ball affinity were unknown as evidenced by a paucity of prior art teachings, which unknown combination yielded unexpected results when prior art teaching stating it could not be done?

## VIII

Whether the unexpected tennis ball retrieving attributes of the tennis racquet equipped with the tennis ball retrieving attachment renders claims 1-7 and 9 and its method of use of claims 10 and 12 patentable over *Feldi* or *Musslin* French patent; and either in view of *Melbye* and an alleged admission of the prior art by Appellant in her specification.

## IX

Whether Appellant's substantiated unexpected efficacy in tangentially lifting of all major tennis ball brands rebuts any *prima facie* case of obviousness which may arise, if any, in the 35 USC 103(a) rejection of Appellant's claims 8, 11 and 13-15 as being unpatentable over *Feldi*,

*Musslin*, or *Melbye et al*; and alleged Appellant's admission of the prior art in Appellant's specification in view of *Urwin* of the final rejection under 35 USC 103(a).

### **Grouping of Claims**

**Group 1:** Tennis ball racquet equipped with tennis ball attachment of Claims 1-3.

**Group 2:** Tennis ball racquet equipped with a tennis ball attachment as defined by Claims 4-9, which claims of the group do not stand or fall together.

**Group 3:** The method of retrieving grounded tennis balls with a tennis ball equipped with a ball retrieving attachment attached along an outer peripheral edge of a shoulder of the tennis racquet as defined by method Claims 10-15, the claims of which do not stand or fall together.

**Group 4:** The tennis ball attachment of Claim 8 and the method of retrieving a ground tennis ball of Claims 11 and 13-15, the claims of which do not stand or fall together.

### **Argument**

#### **35 USC 103(a)-(First Rejection)**

The 35 USC 103(a) rejection of claims 1-7, 9, 10 and 12 as unpatentable over U.S. Patent No. 4,834,393 to *Feldi*, or French Patent No. 2,594,037 to *Musslin*, and either in view of U.S. Patent No. 5,077,870 to *Melbye*, and appellant's admission of the prior art in his specification is in error and should be reversed.

#### **35 USC 103(a) - (Second Rejection)**

Similarly, the finally rejected claims 8, 11 and 13-15 as being unpatentable over *Feldi*, *Musslin*, *Melbye* and Appellant's admission of the prior art in his specification in view of the *Urwin* U.S. Patent No. 4,993,712 under 35 USC 103(a) should be reversed.

The final rejection of Appellant's claims 1-15 as being obvious in view of the prior art as relied upon in the 35 USC 103(a) rejection of record presents one of the most difficult responses that Appellant's attorney has encountered in more than four decades of patent practice. Appellant's attorney respectfully submits that both 35 USC 103(a) rejections of record are not in accord with standards of patentability as commanded by Title 35, the M.P.E.P. guidelines and the well established case law.

The following three basic elements needed to establish a prima facie case of obviousness as set for in M.P.E.P. 2142 are lacking:

- a) suggestions or motivations to modify the references or combine teachings;
- b) must be a reasonable expectation of success;
- c) the prior art references when combined must teach the claimed limitations.

*Appellant's Claimed Inventions as a Whole* (Claims 1-15)

Appellant's claimed invention, as a whole, provides many untaught features and unexpected results over what was heretofore expectedly believed to be feasible, which factors are the antithesis of obviousness.<sup>1</sup> The prior art is devoid any teachings that an unknown tennis ball attachment 30 equipped with uniquely and distinguishable monofilament hooks 31, when applied as a strip to the inwardly curving convex shoulder 12 (position which can only yield a single tangential contact site with tennis ball surface) of a tennis racquet 1 would have the unexpected affinity of repeatedly engaging onto the nap N of the tennis ball T and repeatedly lifting all of the major brands of tennis balls T. Appellant's discovery constitutes an unexpected result, especially when viewed over what was disparagingly taught by the art of record.<sup>2</sup>

Unlike other tennis ball retrieving devices suggested by the prior art, the design and nature of Appellant's attachment 30 when used in combination with the streamlined design of a conventional tennis racquet 1 does not detract from the player's effective use of the tennis racquet 1. The strip or ball attachment 30 adhesively affixed to the shoulder 12 does not unbalance the tennis racquet 1 or create undue weight or drag upon the streamlined racquet 1. The attachment 30 (as claimed) allows the tennis player to use the racquet 1 as it was professionally designed. Unlike the bulky attachments of the prior art (e.g. see cupping the ball or grasping mechanism of *Urwin*) which were regarded as necessary in order to achieve any retrievability, a non-intrusive ball retrieving attachment 30 comprised of a thin strip of unique monofilament hooks 31 placed upon the racquet shoulder 12 allows for repetitive ball retrieval simply upon tangential contact (as illustrated in Appellant's figures 2B and 4) of the tennis ball nap N.

All of Appellant's claims 1-15 include specific and exclusively limiting claimed limitations of a very precise tennis ball retrieving attachment **30** equipped with a one-of-a-kind hooked material **31** which, as disclosed in Appellant's specification and substantiated by Appellant's comparative test results of Appellant's example and the Rule 132 Affidavit of Record, reveals and proves the unique and totally unexpected efficacy of repetitively engaging and lifting all major tennis ball brands at a loaded weight capacity of 4-6 times the tennis ball weight.

With particular reference to Figure 5, Claims 4-9 prescribe in greater specificity the unique monofilament hooked material **31** of the unique attachment **30** defined as having:

- a) an average hook height  $h$  of at least 1.85 mil;
- b) an average hook width  $w$  of at least 1.0; and
- c) an average hook depth  $H_d$  of at least 0.6.

The discovery of a tennis ball retrieving attachment **30** possessing these attributes and the effect these attributes will have upon a material alien to its mating loop (i.e. a tennis ball nap  $N$ ) upon tangential contact so as to effectively lift all tennis balls constitute Appellant's contribution of unknown teachings. The unexpected hooking and lifting affinity of Appellant's claimed attachment upon a grounded tennis ball is undisclosed and untaught by the art of record and accordingly constitutes Appellants sole contribution. Claim 10 likewise further prescribes those highly unique claimed embodiments (e.g. see figure 5) by defining even more precisely the highly limited and precise monofilament hook material prerequisites as one having an average monofilament diameter characteristic of:

- a) at least 8.0 mil;
- b) an average hook height of at least 1.85 mm;
- c) an average hook width of least 1.0 mm; and
- d) an average hook depth of at least 0.6 mm

with the hooks **31** being of a spiral configuration arranged in repetitive rows of at least 250 hooks per square inch. Combination Claims 4-8 and method claims 10-15 also define uncommon characteristics of a one-of-a-kind monofilament hooked material **31** (undisclosed by any of the

patents relied upon in the 35 USC 103(a) rejections of record) which because of its unique, atypical compositional and structural characteristics tenaciously penetrate and hook onto all brands of tennis ball pile N and will allow all major brands of tennis balls T to be repetitively lifted without fail and thereby consistently retrieved by the tennis player. The unique interrelationship between Appellant's ball retrieving attachment 30 and the tennis ball nap N constitutes an unknown relationship and unsuggested combination which yielded totally unexpected results.<sup>7</sup> The unexpected phenomena of engagement and hooking commences upon tangential contact of the tennis ball nap N. The uniquely different average hook height  $h$ , the average hook depth  $H_d$ , the average hook diameter  $d$ , and the average hook width  $w$ , in combination with the spacial configuration arrangement in rows of at least 250 per square inch provides a unique cooperative interrelationship with the tennis ball nap N of all major brands which tenaciously and repeatedly engages the tennis ball nap N without fail, while all others consistently fail. None of the one-of-a-kind claimed prerequisites of the nylon monofilament hook are disclosed by any of the patents relied upon the 35 USC 103(a) rejections of record. The amazing ability to tangentially lift four to six times a tennis ball's original weight is totally unexpected, especially when the very art relied upon the Examiner concluded the unfeasibility of such a feat.

Appellant's method claims 10-15 are further directed to adhesively applying (i.e. step b) a unique tennis ball attachment 30 including a strip of hooked material 31 to the shoulder 12 (a shape non-conforming to the shape of a tennis ball) to a tennis racquet 2 and which allows the tennis ball player upon tangential contact (only possible contact) with a resting tennis ball T to engage onto the pile N of the tennis ball T and allows the tennis ball T to be repetitively lifted by the ball retrieving attachment 30. Prior to Appellant's invention, none of the ball retrieving attachments were capable of producing such an unexpected result.<sup>7</sup> The unexpected results of Appellant's invention is part of the invention *as a whole* and is clearly elucidated in Appellant's specification, as well as being set forth in the Appellant's Rule 132 Affidavit of Record.

Any 35 USC 103(a) rejection must necessarily flow from the prior art teaching as interpreted or understood by the ordinary artisan without any reliance upon Appellant's own

teachings. Unfortunately, the patents relied upon in the 35 USC 103(a) rejections of claims 1-15 have been randomly gleaned for isolated patent teachings, taken completely out of the context in which they are found, discordantly combined with each other as an improper 35 USC 103 patent or reference combination in a manner which is totally contradictory to the very patent teachings relied upon in making the 35 USC 103(a) rejections of record.<sup>1</sup> The rationale for combining the isolated patent teachings stems solely from Appellant's teachings which only through retrospect may be seen to bear some sort of relevancy amongst otherwise clearly discordant prior art patent teachings<sup>5</sup>. This constitutes nothing more than hindsight obviousness.

*Factual Analysis and Evaluation of Cited Prior Art Teachings (All Issues)*

In order to ascertain the relevant suggestive teaching of a patent and determine what, if any, motivation may be suggested thereby, it is necessary to first factually analyze what each of the respective patents teach and whether these teachings (when viewed as a whole, as well as the prior teachings) may be properly relied upon (singularly and collectively) as suggestive teachings in a reference or patent teachings combination under a 35 USC 103(a) rejection. Absent the necessary teachings and suggestions to combine the patent teachings, as a whole, there exists no motivation to combine the patent teachings<sup>4</sup>.

Pursuant to this factual analysis, the attention of the Board of Appeals is accordingly and courteously directed towards the following "Facts" as taught and suggested by *Feldi*:

*Feldi Patent Facts (Relevant to All Issues)*

1. **FACT** - The final rejection's reliance upon the *Feldi* abstract teachings of "using two components in any form or manner to retrieve a tennis ball" means precisely what *Feldi* clearly teaches (i.e. use of both the mating loop component and mating hook component as a fastening system). The *Feldi* ball gripper concept of "using the two components of VELCRO or any brand hook and loop fastening system" as taught in the *Feldi* abstract" means precisely that both the mating fastening hook and loop components must be used together in the *Feldi* ball retrieving fastener system. There is nothing in *Feldi* which teaches a hook component should be used or would work alone in the absence of the loop



component of the fastener combination or fastening system. *Feldi* neither expressly teaches nor suggests equivalency between each and every hook amongst the host of known mating two-component hook and loop systems. Any equivalency as taught by *Feldi* exists solely in the hook and loop “fastener system”. The “system” (not the hook alone or loop alone) is the *Feldi* “fastening system”. *Feldi* solely teaches the conjoint use of both the hook and loop fasteners together and does not in any form or manner suggest using a hook alone since, as taught by *Feldi*, it does not work by itself (i.e. engage and lift the tennis ball). *Feldi* does not establish any relationship of hook and loop fastening systems for an entirely different purpose and entirely different combination, and does not establish any equivalency between different materials<sup>10</sup>.

2. **FACT** - The primary reference *Feldi* (in reference to U.S. Patent No. 3,874,666 to Ross) concludes that, a hook material when affixed to the end of a tennis racket does not effectively pick up standard tennis ball with this system, in “the standard material”(i.e. meaning the ball covering) “is not compatible with the hook fastener system... that, the hooked material destroys the tennis ball covering.” (e.g. see Col 1, lines 15-25)<sup>12</sup>
3. **FACT** - A Velcro hooked component as tested and described by *Feldi* does not work (via tangential contact) upon the tennis ball felt cover as claimed by Appellant’s claims herein. Therefore, Appellant’s claimed invention is totally unexpected in view of the *Feldi* teachings<sup>7&12</sup>.
4. **FACT** - The *Feldi* solution to the problem is to use the hook and loop fastening system in its intended cooperative manner by eliminating the conventional tennis ball pile or nap covering and replacing the tennis ball pile covering with either the loop or hook component of the fastener system combination so that the hook and loop component can then effectively hook and fasten together as intended in the hook and loop fastening system (e.g. see *Feldi* abstract and claim). Both the mating hook and mating loop fastening system must be used together in *Feldi*. There is no suggestion, teaching or

motivation by *Feldi* that the hooked component may be used separately apart from the mating loop component.

5. **FACT** - Appellant's claims recite a ball retrieving attachment "for engaging and lifting a grounded *tennis ball* upon **tangential contact** with said *tennis ball* ... for engaging and lifting the grounded *tennis ball* upon tangential contact with said hooks", which constitutes the antithesis of what *Feldi* teaches and suggests to the ordinary artisan.
6. **FACT** - The altered ball of *Feldi* is not a tennis ball (nylon hook or loop cover), since a tennis ball by standard of identity "must be covered with felt." Felt is notoriously known and defined as "a cloth or fabric made of wool, or of wool and fur or hair" (e.g. see Appendix Exhibit C. Neither the hook component nor loop component of *Feldi* comprises wool (e.g. see Appendix Exhibit D). Therefore, the altered ball of *Feldi* is not a tennis ball and does not meet the claimed "tennis ball" requirements of Appellant's claims. (See Appendix Exhibit E of Wilson Sporting Good's statement as to tennis ball standards of identity which defines a tennis ball as having a wool pile cover).
7. **FICTION** - There is no basis, in fact, for the speculative conclusion that "the claims do not preclude changing the tennis ball pile and the *Feldi* racket itself, as modified above, would inherently function as recited." Inherency of *Feldi* rests on using both the hook and loop fastening system combination, not in the hook alone. Inherency doctrine does not apply since inherency must be proven and cannot be presumed.<sup>2</sup>
8. **FACT** - *Feldi* neither discloses nor remotely suggests "a ball retrieving attachment attached to a shoulder of the racquet in ball retrieving position" characterized as "a series of preshrunk nylon monofilament hooks... having a monofilament diameter great than 8.0 mil and an average hook height of at least 1.70 mm." which upon tangential contact with the tennis ball felt cover engages the pile and thereupon allows the ball to be lifted thereby. *Feldi* states unequivocally that the hook components of the type as known and understood by *Feldi* do not work (e.g. see Col. 1, lines 15-24)<sup>1</sup>.

9. **FACT** - Two significant and material claimed limitations (i.e. tennis ball) *tangentially engaging and lifting a standard tennis ball* (i.e. wool pile) with a very unique narrowly defined tennis ball retrieving attachment equipped with precise hooked material (Claim 1 diameter greater than .8 mil, average height at least 1.70 mm; Claim 10 diameter at least 8.0 mil, average hook height at least 1.85 mm; average width at least 1.0 mm; and average depth at least .6 mm and at least 250 hooks per square inch of spiral configuration arranged in repetitive rows) are neither disclosed nor remotely contemplated by *Feldi* nor any of the other patents relied upon in the 35 USC 103(a) rejections of record.
10. **FACT** - Appellant's results are completely unexpected in light of *Feldi*'s prior art teaching that a Velcro hook material will not work and the need to completely alter or replace the tennis ball pile covering with a loop component covering or vice versa so that the two VELCRO or SCOTCHMATE mating hook and loop components of the fastening system will hook, loop and engage onto one another in the manner in which they were designed and intended to function..
11. **FACT** - An essential embodiment of *Feldi* is to change the ball covering to either a loop or hook component (or hook component) and, therefore, the resultant ball can no longer be recognized as a tennis ball which definition precludes a ball having a Velcro loop or hook covering.
12. **FACT** - The *Feldi* patent teachings cannot be applied against appellant's claims without first destroying the basic and novel teachings (i.e. replace wool pile covering with Velcro), as well as the essence of the *Feldi* patent (i.e. the need for both the hook and the loop of the fastening system).<sup>1</sup>
13. **FACT** - In combining the *Feldi* patent teachings with any of the other cited patents, an essential *Feldi* teaching must be totally disregarded or omitted, namely, an essential use of the two component hook and loop fastening system together and entailing the necessity to change the tennis ball cover to either a hook or loop component which as applied in the 35 USC 103(a) reference combination by the Examiner *ipso facto* renders the *Feldi*

teaching inoperable and unfit for its intended function and purpose if, in fact, the cover remains unchanged.<sup>1</sup>

14. **FICTION** - The final rejection assertion that the Velcro hook and loop fastener combination material as defined and used by the *Feldi* is an equivalent to the narrowly defined hooked material as prescribed by Appellant's claims misstates the underlying premise (i.e. teachings and suggestions) that *Feldi* solely and essentially discloses the combination of both the mating hooked and mating looped components used together and not separately.<sup>10</sup>
15. **FACT** - *Feldi* has no relevancy to a specially designed hook material by itself, *Feldi* prescribes only the combination of a mating hook component and mating loop component system.
16. **FACT** - Neither the ball retrieving attachment nor the hooked material as defined by *Feldi* perform the same function as Appellant's narrowly defined and uniquely different hooked material and, therefore, it cannot be regarded to be the equivalent to the claimed ball retrieving attachment or hooked material of Appellant's claims.<sup>10</sup> The mere fact that a product brand is called a SCOTCHMATE or VELCRO in defining a two component system does not render it *ipso facto* equivalent, since as shown by the Appellant's affidavit, *Melbye et al* mushroom type fasteners do not work as do all the other hooked materials except the claimed one of claims 1-15.<sup>10</sup>
17. **FACT** - Inherency cannot be presumed but must be proven by the prior art, not by Appellant's contribution, M.P.E.P. 2112.

The following facts underlying the French *Musslin* Patent teachings are deemed relevant towards an ascertainment as to what it teaches as a whole, what motivation it may suggest to the ordinary artisan and the 35 USC 103(a) rejection of record.

#### **Musslin Facts (All Issues)**

1. **FACT** - The teachings of the *Feldi* patent (filed December 27, 1987 and patented May 30, 1989) and *Urwin* (patented February 19, 1991) summarize the technology and prior art as

commonly understood by the ordinary artisan after the *Musslin* patent (registration date of 02/07/1986) was published and, therefore, *Feldi* and *Urwin* accurately summarize the state of the known art after the *Musslin* patent filing (i.e. VELCRO or any other monofilament hooked materials will not tangentially engage and lift tennis balls). This prior art commonly accepted understanding is in complete accord with Appellant's background of the invention disclosure as summarized in page 1, line 5 - page 4, line 8.

2. **FACT** - The *Musslin* patent fails to provide any information as what constitutes a suitable cloth (wrapper) with hooks (including metal fastening threads) which may be utilized in the French patent.
3. **FACT** - The *Musslin* patent fails to provide any enabling teachings (i.e. as prescribed by 35 U.S.C. 112) so as to enable anyone of ordinary skill to make and use a non-enabling substance of the *Musslin* invention.
4. **FACT** - Both *Urwin* and *Feldi* (after *Musslin*) teach that the hook component will not work upon tangential contact.
5. **FACT** - *Musslin* neither discloses nor remotely teaches use or Applicant's claimed ball retrieving attachment comprising "hooked fastener material having a series of pre-shrunk nylon monofilaments ... of ... "an average diameter greater than 8.0 mil and an average hook height of at least 1.70 mm (claims 1-9 ) or the method claim 10 limitation of an average:
  - height of at least 1.85 mm (also claims 4-8 and 10-15)
  - diameter of at least 8.25 mil (also claims 4-8 and 10-15)
  - hook width of at least 1.0 mm (claims 4-8 and 10-15)
  - depth of at least 0.6 (claims 4-8 and 10-15)
  - at least 300 hooks per inch squared (claim 9)
  - at least 250 hooks (claim 10)
6. **FACT** - *Musslin* leaves the artisan completely in the dark as to what works and what does not work which in light of the *Feldi* teachings indicates *Musslin* is nothing more than a

conceptual paper patent leaving the artisan to a myriad of possible applications which, as taught by both *Urwin* and *Feldi*, don't work (without increasing significantly the surface area of contact or ball cover) as evidenced by both the *Feldi* and *Urwin* patent teachings of record.

7. **FACT** - Essential claimed elements of Applicant's claimed ball retrieving attachment and hooked material are not disclosed by *Musslin*.

#### **Analysis of Melbye Facts (All Issues)**

A factual analysis of the *Melbye et al Patent* teachings reveals the following facts:

1. **FACT** - The prior art teachings of Column 1 line 15-23 defining "widely used garment fasteners under the trademark VELCRO... and under the trademark SCOTCHMATE refers solely (as in *Feldi*) to combined use of the mating hook component and the mating loop component as fasteners which are designed to matingly engage and fasten together. These teachings have no relevancy to the separated components or their separate use. The teachings of *Melbye, et al* as cited and relied upon in the final rejection simply means that the hook and loop components, when used together, serve as "garment fasteners." This is no different than the "hook and Loop fastener system" of *Feldi*. To rely upon their inseparable teaching (hook and loop fastener systems or garment fasteners) to establish equivalency between all hook components is factually and legally wrong.<sup>10</sup>
2. **FACT** - The *Melbye* mushroom type hook strip is not a "hooked fastener material having a series of preshrunken nylon monofilament hooks... characterized as having a monofilament diameter greater than 8 mil and an average height of at least 1.70 mm.", as should be self evident by a comparison of Appellant's Figure 5 with the *Melbye, et al* Figure 2. Appellant's claimed hooked material is entirely different from the *Melbye, et al* mushroom type fasteners as clearly revealed by *Melbye, et al*, as well as Appellant's disclosure and the Rule 132 Affidavit of record.

3. **FACT** - The *Melbye, et al* mushroom type fastener is a blow molded (e.g. see Col 5, lines 35-50) processed under specialized conditions, preferably of a copolymer of polyethylene and polypropylene (e.g. see Col 5, lines 4-10), and not a pre-shrunk monofilament hooks of a specific characterization as claimed by Appellant.
4. **FACT** - The *Melbye et al* mushroom type strip when applied as a hooked fastener does not work, as clearly evidenced by Appellant's Rule 132 Affidavit.
5. **FACT** - The *Melbye* mushroom type strip (defined and shown as upstanding stems with a mushroom head - Col. 2, lines 48-50) is not an actual and obvious equivalent to the unique and distinctly monofilament nylon hook fastener materials as defined by Applicant's claim. (Equivalency must perform the same functional result.)<sup>10</sup>
6. **FACT** - Merely by reason that *Melbye et al* discloses a host of different types of garment fasteners sold under the different brand labels, including both the hook and loop fastening system and the mushroom type fasteners, does not mean that all hook and loop fasteners or mushroom type fasteners are the actual and obvious equivalent to one another as evidenced by Applicant's 132 Affidavit. This is further self-evident by the procurement of the *Melbye et al* patent rights to mushroom-type hook strip claims predicated upon unique compositional and manufacturing conditions which reportedly yield fasteners of superior break force, shear strength and T-Peel properties.
7. **FACT** - To apply *Melbye* as a 103 reference would require a total disregard of the essence of the *Melbye* patent, (i.e. replace the mushroom type fastener with an unrelated and completely different nylon monofilament hook component of totally different hook characteristics), and a hindsight reliance upon Appellant's invention to reconstruct art a hypothetical meaning which was never intended by *Melbye, et al*.
8. **FACT** - The *Melbye et al Patent* contains no suggestive teachings that its mushroom type fastener or any other "garment fastener" may function as a ball retriever for a tennis ball.

Pursuant to the 35 USC 103(a) requirement of a resolution of factual background before resolving the obviousness legal issues, the following *Urwin Patent* facts warrant careful consideration:

**Urwin Facts** (All Issues particularly II, III, VI, VII and IX)

1. **FACT - *Urwin*** does not disclose the essential embodiments of applicant's invention, nor does *Urwin* teach that one would succeed with a ball retriever by simply tangentially contacting, engaging and lifting a tennis ball with any material, let alone the uniquely defined ball retrieving attachment as precisely prescribed by Applicant's claims 1-15.
2. **FACT - *Urwin*** teaches precisely the opposite from Appellant's claimed "tangential contacting" by stating that "a strip which follows the contour of the head of the tennis ball racquet has a curve diametrically opposite to the curve of the tennis ball, *meaning that only one small area of the strip can come in contact with the tennis ball, making it very unlikely that the ball can be grasped securely enough to be picked up.*" (e.g., see Column, 2, Lines 1-10). The words "unlikely that the ball can be grouped securely enough to be picked up" summarizes the state of the prior art prior to appellant's involvement.
3. **FACT - *Urwin*** states that the most appropriate place "where the apparatus provides a means to attempt to grasp the tennis ball and that is at the butt end of the handle of the tennis racquet." (Column 1, Lines 61-64).
4. **FACT -** As stated throughout the *Urwin Patent* and as succinctly stated in Col 2, line 30, a key element of the *Urwin* invention constitutes:

*"A removable ball gripping member which is configured in an arcuate shape conformed to the shape of the ball which is being retrieved, such as a tennis ball, and which further comprises gripping means to grasp the surface of the ball." (emphasis added)*

as illustrated in Figure 6 of *Urwin*. In complete contrast to *Urwin*, Appellant's ball engaging and lifting strip attachment 30 follows the "curve diametrically opposite to the curve of the tennis ball of the tennis racquet shoulder 12 as illustrated in Appellant's



Figures 2B and 4 provides only a single tangential point of contact with the tennis ball T, which is a direct antithesis from *Urwin's* cupping or accurate shape conforming to the shape of the tennis ball teachings as illustrated by *Urwin's* Figure 6. The contacting surface of a tennis ball T with Appellant's claimed ball retrieving attachment 30 the attached to the tennis racquet shoulder 12 at "a curve diametrically opposite to the curve of the tennis ball and *Urwin's* ball conforming and cupping contact involve entirely different modes of operation, as is clearly illustrated by a comparison of Appellant's Figures 2B and 4 with *Urwin's* Figure 6.

5. **FACT AND FICTION** - The Examiner's reliance upon Col. 4, lines 8-13 of *Urwin* is wrong since the cup shaped ball retriever 10 of Figure 3 includes a base having a Velcro strip 24 which allows the removable cup shaped retriever 10 of a tennis ball curvature to be attached or detached to the Velcro strip 30 as referenced in Col. 4, lines 8-13. VELCRO strip 30 is not the ball retrieving ball gripper 10 of *Urwin*. This removable feature is the second key element of *Urwin's* ball retriever which is a fastening means 24 for the ball gripping member attached to the racquet, preferably at the butt of the handle as shown in *Urwin* Figure 6. The VELCRO strip 24 of Figure 1 as taught and disclosed by *Urwin* does not pick up the ball, but serves only as a mount for ball gripper 10 of *Urwin*. If it did, the entire *Urwin* teachings would become meaningless.
6. **FACT** - The essence of the patented invention of *Urwin* relies upon grasping the tennis ball surface within an "arcuate shape conformed to the shape of the ball" encompassing arcuate arm 16 and 18 by providing a cup shaped retriever 10 which envelopes over a large portion of the conforming tennis ball surface permits the tennis ball to be grasped and lifted thereby. These teachings are essential to *Urwin* and clearly lead the artisan away from Appellant's unique and unexpectedly superior ball retrieving attachment.<sup>12</sup>
7. **FACT** - The applicant's claimed invention of tangentially contacting, engaging and lifting of the tennis ball cover with the unique claimed tennis ball strip 30 upon the convex, non-conforming rounded surface of a tennis racquet shoulder 12 is completely

contradictory to the ball encompassing and grasping teachings of *Urwin*. More surprisingly are the unexpected results of Appellant's claimed invention, especially when viewed in light of *Urwin*'s clear teachings that such an approach would make it very unlikely to effectively grasp and pick up the tennis ball. (e.g. see 2 above).<sup>7</sup>

8. **FACT** - Appellant's claimed invention relies upon entirely different principles and mode of operation and requirements from that disclosed by *Urwin*. (Cupping and grasping vs. tangential contacting and lifting.)
9. **FACT** - The removable ball gripping member "configured in an arcuate shape conformed to the shape of the ball which is being retrieved" teachings of *Urwin* constitutes an essential embodiment and teaching of the *Urwin* patent. Accordingly, it would be impermissible when relying upon *Urwin* to completely disregard these basic and novel<sup>1</sup> *Urwin* teachings which, in fact, undermines the entire underlying rationale of the Examiner's position in the 35 USC 103 reference combination of record. The antithesis of what a patent teaches represents a clear showing of unexpectedness and unobviousness.
10. **FACT** - Applicant's tangential contacting completely contradicts the need for the ball conforming teachings of *Urwin*, and therefore, *Urwin* clearly teaches, directs and motivates the artisan away from the unique embodiments of Appellant's claims 1-15.
11. **FACT** - The *Urwin* invention would be rendered inoperative (as taught by *Urwin*) by the replacement of the ball conforming retainer with the non-conforming tangential contacting engaging and lifting embodiments of Appellant's claimed invention.<sup>1</sup>
12. **FACT** - Appellant's tangential contacting and lifting embodiments are totally unexpected in view of *Urwin*'s teachings.<sup>12</sup>

Since the 35 USC 103(a) analysis requires an analysis of all the facts (including those which support the unobviousness), the aforementioned facts as taught by *Urwin* provides clear evidence of the unobviousness of the Appellant's claims 1-15 as well as those claims 8, 11, 13-15.

#### **EQUIVALENCY FICTION (All Issues)**

1. **FACT** - The “garment fasteners” referred to in the prior art dissertation of *Melbye et al* and the “VELCRO or any other brand hook and loop system” mentioned in the *Feldi* Abstract pertain solely to *paired and mating hook and loop fastening system of a two components system* which cooperatively engage and hook together and requiring that the two interlocking components of the system be used. These teachings merely describe a cooperative relationship of “garment fasteners” of the hook and loop fastener system which bear no relationship whatsoever to anything other than “system” and have no relevancy to a hooked component by itself. This does not establish equivalency (actual and legal) between all hooked components apart from that conjoint use of both the hook and loop components as a fastening system (i.e. any mere relationship of the system does not extend to a dissection of the hook component from the loop.) It merely discloses that the hook and loop fastening system when used together serves as a garment fastener.
2. **FACT** - Appellant has never acquiesced or stated that the ball retrievers as disclosed by the prior art are the equivalents (actual and obvious) to appellant’s tennis ball retriever attachment equipped with uniquely different hooked monofilaments of the highly specified structure and characteristics as prescribed by Appellant’s claims.
3. **FACT** - Appellant has never acquired that the hooked material of the appellant’s ball retrieving attachment is equivalent to any other hooked material of any other hooked and looped fastening system.
4. **FACT** - Appellant’s Rule 132 Affidavit refutes in total the Examiner’s unwarranted and unsubstantiated assertion that all tennis ball retrieving attachments of any hook and loop fastening system and all hook components are the actual and obvious equivalents to one another including Appellant’s unique tennis ball retriever attachment.<sup>10</sup>
5. **FACT** - Contrary to the Office Action’s assertion, there exists a host of different substances which heretofore were recognized by the art of record as incapable of tangentially engaging and lifting a tennis ball therewith, and that pursuant to these prior art teachings, tennis ball lifting efficacy could only be accomplished by increasing the

contacting surface in a cup-wise or grasping fashion so as to provide sufficient grasping surface with the ball so as to permit the hook fasteners to lift the ball thereby (*Urwin*) or by changing the ball and retrieving racquet to the two component hook and loop fastening system (e.g. *Feldi*).

6. **FACT** - Equivalency is clearly refuted by the cited art of record which clearly states that the Velcro fasteners as used and applied by the prior art were incapable of providing the unexpected tangential contacting engaging and lifting attributes of Appellant's unique ball retrieving attachment of claims 1-15. Consistent with the unequivocal prior arts teachings that a hook component of the hook and loop fastening system itself is incapable of achieving Appellant's claimed result, the uniqueness of the Appellant's ball retrieving attachment equipped with precisely characterized monofilament fiber hooks as claimed herein provides a totally new and unexpected result within an art background consistently believing that it could not be done.
7. **FACT** - If none of the references of record disclose or define a ball retrieving attachment equipped with an undisclosed monofilament hooked material (as uniquely and distinctively claimed herein) which is uniquely and solely able upon tangential contact to lift all major tennis ball brands therewith, there cannot be any equivalency when, in fact, all of the references relied upon in the 35 USC 103(a) rejection fail to remotely disclose these unique claimed embodiments of Appellant's invention in sufficient detail so as to enable anyone of ordinary skill to make and use Appellant's invention.
8. **FACT** - Equivalency cannot be predicated upon an unexpected and unique function totally absent from all other functions as relied upon in the 35 USC 103(a) rejection and alleged to be equivalent.

#### **No Prima facie Case of Obviousness**

Appellant respectfully submits that the art relied upon in both of the 35 USC 103(a) rejections of Appellant's claims 1-15 fails to establish a *prima facie* case of obviousness. Even if the cited prior art were deemed sufficient to establish a *prima facie* obviousness, then the

unexpected and astounding results of Appellant's claimed invention would clearly rebut any such *prima facie* case of obviousness.

The prior art facts of record (i.e. the cited patent teachings relied upon in the 35 USC 103(a) rejections) have been taken totally out of context in which they are found and combined (not because of what the prior art teaches) solely by reason of Appellant's own unexpected and unknown teachings and discoveries.<sup>8</sup> Any *prima facie* case of obviousness under a 35 USC 103(a) rejection requires at a minimum the existence of concrete facts and not speculative conclusions of untaught matters which only have plausible meaning or reliance when viewed solely in light of an inventor's discoveries or findings. The essential requirement of M.P.E.P. 2142.03 that "to establish a *prima facie* case of obviousness, all of the claimed limitations must be taught or suggested by the prior art" has been completely over looked as evidence by the need to rely exclusively upon appellant's own teachings as a critical element of the 35 USC 103(a) rejections.

The method claims 10-15 involve a step (a) of providing a tennis ball retrieving attachment 31 meeting stringent claimed requirements completely undisclosed and untaught by the art of record.

It is an axiomatic legal requirement (essential to any *prima facie* case of obviousness) that any proper 35 USC 103(a) rejection must be solely predicated upon what is fairly taught and suggested by those references or patents relied upon in the 35 USC 103(a) rejection, as a whole, without resorting to an Appellant's own discoveries or teachings to provide crucial prior art teaching of claimed elements which are untaught and unsuggested by the prior art.<sup>11</sup> This basic patent examining premise prevents a 35 USC 103(a) examination from falsely relying upon a hindsight reconstruction of the prior art solely in view of Appellant's own discoveries and inventions to provide untaught and unsuggested matters. If the prior art fails to fairly teach or suggest what an Appellant has found, then the final rejection lacks the necessary factual basis upon which to predicate a *prima facie* case of obviousness under 35 USC 103(a). Appellant's own findings are not prior art teachings and there exists clear error under any guise (including an

alleged admission of equivalency) of relying upon Appellant's own findings and teachings as a pinion for speculatively combining discordant patent or reference teachings under 35 USC 103(a).

Appellant's invention relies upon un contemplated and uniquely different claimed features which are neither taught, suggested, nor remotely contemplated by any of the prior art patents of record (i.e. *Feldi, Melbye et al, Musslin and Urwin*). There accordingly exists no facts or motivation for one of ordinary skill to be lead towards those essential and unique embodiments of Appellant's claimed invention. Both 35 USC 103(a) rejections clearly recognize the failure of the cited patents to teach or suggest all of the claimed limitations as is essential for any prima facie case obviousness as prescribed by M.P.E.P 2143.03. The final rejections accordingly must necessarily resort to Appellant's own teaching in order to initially select randomly gleaned discordant teachings from each of the patents<sup>5</sup> and then further mistakenly rely upon an alleged admission of an art recognized equivalency (Appellant's own discoveries)<sup>10</sup> to make any sense whatsoever as to why such isolated and discordant patent teachings (as relied upon in the 35 USC 103(a) rejection) bear some sort of semblance towards Appellant's claimed invention. This is insufficient proof for a prima facie case of obviousness.

In evaluating the 35 USC 103(a) rejections it is important to avoid examining pitfalls of In re Wright - 9 USPO 2d 1649 (Fed. Cir. 1989) which sets forth a clear caveat against any "attempt to show a suggestion of the claimed invention" by "taking statements wholly out of context and giving them meanings they would not have had to one skilled in the art having no knowledge of Appellant's invention, or to anyone else who can read the specification with understanding." The correct factual analysis under 35 USC 103(a), requires a proper assessment of all of the prior art teachings, including those which teach away as well as those which cannot be reconciled with the Examiner's findings of fact in the final rejection. It is unrealistic, as was done herein, "to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Lunsford 148 USPO 721 (CCPA).

*Feldi Teachings and Suggestions* (All Claims - Both Rejections)

Any examination of the *Feldi* teaching clearly reveals a complete lack of relevant teachings suggestive of “a ball retrieving attachment attached to a shoulder of the racquet in a ball retrieving position” so as to provide single site of tangential contact with a tennis ball **T**, as illustrated in Appellant’s figures, which attachment **30** as claimed comprises a series of monofilament hooks **31** having a diameter **d** greater than 8.0 mil and average hook height **h** of at least 1.70 mil (claims 1-3) or even more remotely a monofilament hook characterized as having a diameter at least 8.0 mm and average hook height 1.85 mm, an average width of 1.0 mm, and an average hook depth of at least .6 mm and at least 250 hooks per square inch of spiral configuration arranged in repetitive rows (e.g. see Figure 5). Such crucial facts are neither disclosed nor remotely contemplated by *Feldi* nor by any other patent of record (i.e. *Musslin*, *Melbye et al*, or *Urwin*). Turning more specifically towards those claims requiring an average hook height of at least 1.85 mm, a hook width of at least 1.0 mm, and an average hook depth of at least .6 mm (i.e. see claims 4-8 and 10-15), these saliently unique claimed features are neither taught nor remotely contemplated by any references relied upon in the final rejections herein.

*Feldi* exclusively teaches and uses the mating hook and loop fastening system combination of the “VELCRO or any brand hook and loop fastening system”. This paired hook and loop fastening system combination alone forms the essence of the *Feldi* invention and what *Feldi* fairly suggests and motivates the skilled artisan to do. When combined with any other patent teaching, it is clearly improper to deem *Feldi* as teaching or motivating a skilled artisan to use only the hooked component of the hook and loop fastening system since such an untaught use would destroy the essence of the *Feldi* patent teachings and render it inoperative for its intended use.<sup>6</sup> *Feldi* only teaches and motivates one of ordinary skill to use the hook and loop fastening system.

The reliance of *Feldi* accordingly runs afoul with the prima facie case of obviousness requirements that the *Feldi* teachings as applied render the prior art invention being modified unsatisfactory for its intended purpose, changes the principle of operation of the *Feldi* patent and the change would render *Feldi* inoperative of M.P.E.P. 2142 (2100-99, Rev 1, Feb 2000).

Appellant's claimed ball retrieving attachment 30 equipped with pre-shrunken nylon monofilament hooks 31 of a precise character uniquely distinguishes those known and unworkable tennis ball retrieving attachments from Appellant's claimed and unknown tennis ball retrieving attachment 31. Appellant's unknown tennis ball retrieving attachment 30 remained unknown until it was first unexpectedly discovered by Appellant. "Obviousness cannot be predicated upon what is unknown", In re *Spormann et al* 150 USPO 449. What is unknown cannot be deemed to be part of the prior art. The combination of the tennis ball retrieving attachment 30 as prescribed by Appellant's claim 9, defines a most highly specific and atypical pre-shrunken nylon monofilament characterized as having at least 300 hooks per square inch, an average hook height greater than 1.90 mm, an average hook width ranging from about 1.1 mm to about 1.3 mm, and an average hook depth ranging from .65 mm to about 0.75 mm and an average diameter of at least 8.25 mm. These unique claimed characterizations relate to a tennis ball retrieving attachment 30 equipped with a most unusual and uncommon pre-shrunken monofilament hooked material 31 uniquely (one-of-a-kind) distinguishable from all other known tennis ball attachments. The unexpected superior ball retrieving attributes as prescribed by appellants claims were not known and remained unsuggested until discovered by Appellant. These findings and teachings belong to Appellant and not the prior art.

Amongst the vast array of different paired hook and loop fastener systems (thousands)<sup>B</sup>, manufactured and distributed by numerous different manufacturers (hundreds)<sup>C</sup> under a wide variety of different brand names, all other hooked materials (as known to the Appellant), failed to provide the uniquely different and patentably distinguishable claimed attributes or, more remotely, achieve the unexpected efficacy of the Appellant's claims 1-15, including claim 9 herein. These uniquely different and distinguishable claimed attributes (in the absences of the Appellant's own teachings) remain totally untaught and un contemplated by the cited, which in conjunction with the

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<sup>B</sup>Exhibit B

<sup>C</sup>Exhibit C



unexpected results achieved by the Appellant's claimed invention clearly substantiates that the Appellant's claimed invention, as a whole, remains unsuggested and patentable over by the prior art on record. These facts directly refute the existence of any *prima facie* case of obviousness.

The final rejection necessarily presupposes that these highly unique and unusual findings known only to Appellant, were obviously known to the ordinary artisan notwithstanding that the prior art patents separately and collectively teaches precisely the opposite. An essential element of both 35 USC 103 rejections is the need to rely upon appellant's contribution which clearly contravenes. In re Dance, 160 F.3d 1339, 48 USPQ2d 1635 (Fed. Cir. 1998):

"Obviousness can not be established by hindsight combination to produce the claimed invention... (I)t is the prior art itself, and not the applicant's achievement, that must establish the obviousness of the combination."

It is rather astounding that the *Feldi* patent is deemed to motivate an artisan towards Appellant's claims when in fact *Feldi* clearly teaches that "a hooked VELCRO material when affixed to the end of a tennis ball racquet does not effectively pick up a standard tennis ball." *Feldi* further teaches that the pile of a tennis ball is incompatible with the conventional hook components of the hook and loop fastening system. *Feldi* teaches you must change the attachment and ball nap to a paired hook and loop fastening system. *Feldi* also teaches that a conventional hooked component will destroy the tennis ball covering. The *Feldi* teachings directly contradict what the examiner states in the final rejections and what the Appellant has discovered. Appellant "may rely upon the fact that the prior art teaches the artisan not to do what the Appellant did and achieved unexpected results. This is the antithesis of obviousness." In re Spormann et al 150 USPO 499 (CCPA).

Contrary to the Examiner's assertion, the *Feldi* teachings (as a whole) suggest only using both the mating hook and mating loop components of the paired fastening system to engage onto one another. *Feldi* neither discloses nor contemplates the hook component alone or even more remotely the highly unique ball retrieving attachment characteristics as taught and claimed only by the Appellant herein. Thus, the *Feldi* patent clearly teaches that conventional hooked components

will not work and will not tangentially engage the pile of a tennis ball with sufficient tenacity so as to enable the hooked component to tangentially lift the tennis ball from the ground. When a patent clearly teaches what is alleged to be obvious (e.g. use of a hooked material alone) is not functional or workable, how then can it be presumed under 35 USC 103 that the artisan of ordinary skill would seek a solution in an area in which the *Feldi* patentee teaches as a mere exercise in futility? How can *Feldi* be regarded to suggest or motivate an artisan towards Appellant's claimed invention or that the *Feldi* teachings (as a whole) when combined with other patent teachings can be regarded to suggest and motivate the artisan towards the sole use of a hooked component of the required hook and loop fastening system, much less a hooked component of a very unique character which yields unexpected results? Since *Feldi* teaches that the hooked component is incompatible with a tennis ball cover and that they will not engage or lift the tennis ball, why would it be obvious for an ordinary artisan to seek a solution which totally contradicts the teachings of *Feldi*? *Feldi* directs and motivates the artisan to a solution (e.g. see *Feldi* Col. 1, lines 28 - Col. 2, line 2) which is totally contradictory and directionally opposite from the claimed embodiments of the Appellant's invention herein.

As stated in the *Feldi* Abstract, the "ball gripper is a concept or idea using the two components of the VELCRO or any brand hook and loop fastening system." The *Feldi* patent has no relevance to a hook component by itself, much less the most atypical hook component as prescribed by Appellant's claims 1-15. References or patents when combined as a reference combination under 35 USC 103 may not be used in such a manner which totally negates what a patent or reference fairly teaches or suggests to the ordinary artisan as being essential or necessary.

Since the hooked components do not effectively engage or lift tennis balls, *Feldi*'s inventive solution was to completely change the cover of the tennis ball (contrary to Appellant's invention) to either that hook or loop of the fastening system and then use the other mate of the hook and loop combination so that the two-component fastener system (as consistently taught by the prior art) of changed ball and ball retriever would then effectively engage onto one another as

intended. Since a tennis ball by standard of definition requires a wool pile or wool nap (see Exhibit F) the proposal of *Feldi* would no longer meet the art of recognized definition of a tennis ball (See Exhibit E). The flexible, pliable, and wooly fluffy character of the standard tennis ball would be completely altered to a relative rigid (e.g. nylon per Appellant's claim; or polyethylene and polypropylene of *Melbye et al*) inflexible looped or hooked material tennis ball covering which would no longer function in its intended manner, resulting in a substantial deviation in the performance of the tennis ball play. The ball's flight in air, air drag resistance, velocity, bounce, impacting character, rotational and spin features etc, are exemplary of these changes which would arise by replacing the conventional wool nap of all tennis balls with either the hook or loop or the *Feldi* hook and loop system. It is therefore quite understandable as to why the well established rules of tennis play and tennis balls require a standardized tennis ball which by definition requires a wool nap.

Paragraph No. 4 of the Final Rejection concludes that Appellant's claims do exclude a "tennis ball" with the looped nylon nap as proposed by *Feldi*. As shown by the art of record (Wilson Exhibit E and Exhibit F), a tennis ball by standard of definition requires a wool nap. The looped or hooked nap of *Feldi*'s proposed ball is a rigid loop or hook and not a flexible wool and therefore it is clearly not a tennis ball. Thus the modified *Feldi* ball is *ipso facto* excluded by Appellant's claims. Inherency cannot be presumed under 35 USC 103(a), but must be factually proven.<sup>2</sup>

It should also be self-evident that the *Feldi* teachings lead and motivate the ordinary artisan away from the unique and unexpected discovery of the Appellant's invention. It should also be abundantly clear that *Feldi* neither remotely teaches nor suggests the claimed embodiments of appellant's unique invention. Appellant has great difficulty in understanding the relevancy or how *Feldi* applies to the appellant's invention under the provisions of 35 USC 103(a). How can a primary reference (*Feldi*) be relied upon in a 35 USC 103(a) reference combination when in fact it teaches the futility of the unexpected discovery of the uniquely different claimed features of Appellant's claims? How can a primary reference (*Feldi*) which

teaches the artisan away from an appellant's claimed invention be regarded as providing those enabling suggestive and motivational teachings to direct an artisan towards an unknown invention which completely contradicts the essence of *Feldi*'s teachings?. The Appellant has discovered an invention which *Feldi* teaches as impossible, and even more surprisingly, under circumstances which yielded unexpected results. Under these circumstances, as aptly pointed out by Judge Rich in the decision of *In re Vaack* No 91-1120 (Fed. Cir. 1991):

“Rejection of claimed subject matter as obvious under 35 USC 103 in view of combination of prior art references requires consideration of whether prior art would have suggested to those of ordinary skill in art that they should make claimed composition or device, or carry out claimed process, and whether prior art would also have revealed that such person would have reasonable expectation of success; both suggestion and reasonable expectation of success must be founded in prior art, not in applicant's disclosure.”

*Feldi* neither provides the motivation nor any reasonable expectation of success.

It is an equally troubling concern under 35 USC 103(a) that when the *Feldi* patent is combined with another patent or reference of record, those basic and novel features critical to an appreciation of *Feldi* patent teachings, as a whole, are summarily disregarded in the combined teachings (i.e. not considered a part of the combined teachings) with an end result of a hypothetical reference combination (combined teachings) which completely negates and destroys the essence of the *Feldi* teachings.<sup>1</sup> *Feldi* teaches as an essential embodiment of his invention that the cover of the tennis ball must necessarily be completely changed to one of the mating looped component or the mating hook component of the two-component VELCRO fastening system so that the hook and loop fastening systems is fulfilled. *Feldi* clearly teaches replacing the tennis ball wool nap with the mating looped or hooked material with the other mating component on the tennis racquet which allows the mating “hook and loop fastening system” to work conjointly in their intended manner. Yet the *Feldi* patent as applied and relied upon in both of the 35 USC 103(a) rejections proposes a combination of patent teachings as applied which disregards those essential embodiments of the *Feldi* teaching, as a whole, which as taught by *Feldi*, are absolutely necessary to its operability. “The issue of obviousness is not determined by what the references

expressly state, but by what they would reasonably suggest to one of ordinary skill.”, *Ex Parte Berins* 168 USPO 374. Contrary to the Examiner’s assertion, *Feldi* does not teach using a hooked material only but rather only the conjoint use of both the mating hooked and looped fastening system. The manner in which *Feldi* has been applied in the 35 USC 103(a) rejection totally negates what the *Feldi* patent fairly teaches and suggest to the ordinary artisan. What the Examiner is suggesting is to forget about the changing nap of the tennis ball, forget the hook and loop attachment and tennis ball cover fastening system as taught by *Feldi* (i.e. the teachings as a whole) and to use only a hooked material. Clearly this is not what *Feldi* teaches or motivates the ordinary artisan to do. The attempt to rely upon *Feldi* (as well *Urwin* and *Melbye et al*) can be reconciled with M.P.E.P. 2144.05 III which mandates that “a prima facie case of obviousness may be rebutted by a showing that the art in any material respect, teaches away from the claimed invention”. In re Geisler, 116 F3d 1465 43 USPQ 1362 (Fed.Cir. 1997). Appellant did precisely the opposite of what *Feldi* suggests to the artisan. Appellant’s invention relies upon an unknown tennis ball retrieving attachment 30 (heretofore unknown to the artisan and the inventor) equipped with an unique and distinctly different relationship hooked material which surprisingly via an intertwining, and inter-cooperative with the standard tennis ball wool nap provides unexpectedly superior results heretofore totally un contemplated and unknown to the artisan as evidenced by the *Feldi* teachings.

*French Musslin Patent Teachings* (All Claims - Both Rejections)

The French *Musslin* Patent is also relied upon as an alternative primary reference in the 35 USC 103(a) of Claims 1-7, 9,10 and 12 in paragraph 1 of the final rejection, as well as in the 35 USC 103(a) rejection of claims 8, 11 and 13-15. The French *Musslin* patent teachings cannot be read in a vacuum and cannot be properly appraised under Section 103(a) without being viewed in light of the cited *Feldi* and *Urwin* patents, as well as prior art teachings of U.S. Patents Nos. 3,874,666 to *Ross*, 4,210,327 to *Schubert*, and 4,114,881 to *Norton* (e.g. see Appellant’s Background of the Invention) disclosure of page 1, line 18-page 3, line 21. Typical of many foreign patents, the French *Musslin* patent teaches nothing in its brevity and embraces an immense

number of “catching elements” without even disclosing one useful one, while also failing to comply with the minimal 35 USC 112 disclosure and enabling requirements of the U.S. Patent law. The *French Musslin Patent* vaguely refers to a cloth-like wrapper with hooks, including catching elements or hooks ranging from natural, artificial, synthetic or metallic catching elements which adhesively stick or hook onto the ball cloth envelope (e.g. see line 57 on page 1). These *Musslin* teachings embrace an immense group of potential catching elements of a greater magnitude than the paired hook and loop fastening system of *Feldi*, so vast in all encompassing teachings and so indefinite that the artisan is taught nothing. Not even one example of a workable ball retrieving attachment equipped with a specific and workable catching element is disclosed by *Musslin*. An ordinary artisan would be mystified as to what was meant by these vague and indefinite teachings, much less the required enabling teachings of what is to be precisely used and how it is to be used. *Musslin* represents, at best, an experiment to try or test from an unlimited class of potential catching element materials (e.g. see Exhibits B & C). *Musslin* neither discloses nor suggests the unique claimed tennis ball retrieving attachment of Appellant’s claims 1-15, (known only to Appellant) much less the unexpected results. *Musslin* provides no motivation towards Appellant’s device or its unexpected use. The prima facie case of obviousness requirement of M.P.E.P. 2143.03 that all of the claimed limitations<sup>11</sup> must be taught or suggested by the prior art is not met by the *Musslin* teachings.

The manner in which the French *Musslin Patent* is relied upon as a primary reference in under 35USC103 the final rejection of claims 1-7, 9, 10 and 12 in either combination with *Melbye et al* and Appellant’s admission of the prior art in her specifications is most puzzling. The Examiner apparently refers to *Feldi*’s paired two-component hook and loop fastening system as grounds for establishing equivalency and then refers to garment fasteners of hook and loop fasteners as currently marketed under VELCRO and SCOTCHMATE of *Melbye et al* as establishing a basis for equating the equivalency between all hooked materials. This alleged position is taken notwithstanding clear and unrefuted facts that the both *Feldi* and *Melbye et al* background teachings apply only two-component paired hook and loop fastening system as a

fastener combination as a paired system. Appellant's previous remarks above apply with equal merit to the 35 USC 103 combination of the French *Musslin* Patent and the *Melbye et al.*

The entire basis for presupposing clearly unsuggested and untaught facts from the cited patents of record arises via the erroneous application of the doctrine equivalence to matters which are not taught to be equivalent (paired hook and loop fastening systems does not establish equivalency between all hooked materials for unlimited use with every conceivable fibrous or wired material). As stated in each patent, the mating loop of precise physical and compositional make-up is specially designed for paired hooking onto the specially designed and paired looping component and no more. The presumed equivalency rests upon a legally and factually incorrect conclusion of equivalency. This should be self-evident since what has been presumed to be equivalent does not function in the same manner nor does it produce the same result. There exists no factual basis for drawing this conclusion and as elucidated in *Ex Parte Novel* (PO Bd App - 158 USPQ 237), "the Examiner must provide proof to back upon his speculative assertions." The Office Action fails to take into account the existence of hundreds of different patents relating to the manufacture and use of a host of different types of fastener systems, including those of a pedestal and mushroom type as well as those of a hook and loop fastening type (e.g. see Exhibits B & C). A host of different paired garment fasteners and paired hook and loop fastening systems are manufactured and distributed by scores of different manufacturing and distributing sources advertising a full range of hook and loop fastening system amongst within the broad and all encompassing field. Patents are consistently issued upon numerous patentable versions of these paired fastener systems, their manufacture and countless uses. Loops are consistently changed so as to better engage and fasten together with the paired hook. In addition, there exists a wide array of different manufacturers who produce different fastener system combinations under different labels. A vast array of compositional (molecular and chemical composition), structural and functional properties arise by altering the host of different manufacturing conditions as utilized in their manufacture (e.g. as shown by cited *Melbye et al* patent). The end product is manufactured and sold for its intended sole end use as a paired "hook and loop fastening system."

The vastness of the field should be evidenced by the fact there exists no teaching or suggestion of record directing or motivating the artisan towards a unique and unknown claimed ball retrieving attachment 30 of a highly specialized characteristic and which accomplishes an astonishing feat (tangentially contacting and lifting all major tennis ball brands) which others (i.e. 35 USC 103 patents of record) said could not be achieved.

The Examiner is clearly in error by over simplifying the immense scope of the paired hook and loop fastening system and the paired garment fastening field. Even if we were to separate the hook component from its required loop mate, the field of technology is immense. A U.S. Patent and Trademark patent data base search of the "hook and loop fastener" reveals 5215 hits covering a host of garment fasteners and a host of patents direct towards various different processor and a host of product variations to produce a host of different end products. This is exemplified by U.S. Patent No. 4910062 which discloses "the art is replete with sheet materials that can be cut into smaller pieces to form portion of fasteners, and methods for making sheet materials."

Is it not clearly patentable under 35 USC 103 to discover an unknown ball retrieving attachment of an unknown ball retrieving function to produce an unknown and unexpected result which is most astounding in view of clear 35 USC 103 patent teaching stating it cannot be done? The prior art solutions are diametrically opposed (e.g. change ball cover to the hook and loop fastening system and make cupped grasping retrieving attachment of *Urwin*) to Appellant's unexpected discovery and results. The prior art has taught futility of Appellant's solution to a long felt need, all of which provide further objective evidence of the patentability of the claimed method claims 10-15 herein. Obviousness cannot be predicated upon what was heretofore unknown. The prior art rebuts any prima facie of obviousness by materially teaching away from the claimed invention (M.P.E.P 2100-107)

Several noteworthy legal decisions are deemed to have a direct bearing upon the relevancy of the Musslin teachings in the reference combinations as relied upon in the 35 USC 103(a) rejections of record. Attention is directed towards *In re Faye and Fox* 147 USPQ 47 (CCPA) which noted that:



“The best one skilled in the art might glean from the prior art is that any conclusion about the operativeness of halogenated ethanes not disclosed therein would be based on pure speculation, and would be the subject of experimental testing. Many of these tests are of necessity ‘routine’ tests, yet they must be so guided and directed as to eliminate the areas of speculation. Our conclusion in *In re Sprock*, 49 CCPA 1039, 301 F.2d 686, 133 USPQ 360, 364, seems particularly appropriate.” “It seems to us, therefore, that substantial differences exist between the teachings of the prior art and the invention here claimed. The fact that appellants have found a limited class of materials among the necessarily large number of prior art materials is itself a factor to consider as evidence of unobviousness of the claimed invention. See *In re Ruschig*, 343 F.2d 965, 145 USPQ 274.”

Similarly in *Ex Parte Horst* - 844 O.G. 1168, The Board of Appeals held that:

“The most we can say from the reference as the Examiner presents it, is that the worker of ordinary skill in the art would see some similarity between the action of the divalent forms of europium and manganese as activators. The Examiner, in effect, asks us to conclude that such worker would carry this similarity to the point of the obviousness demanded by the stature, as to each and every host material listed by the reference. This we cannot do, anymore than we can conclude from this type of evidence that the prior art recognizes that any known activator will activate any known host material...”

The combination references as applied in the two 35 USC 103(a) rejections of record to Appellant’s claims 1-15 are closely related to the factual circumstances of *Ex Parte Marinaccio* 10 USPQ 2d. 1716 Board of Appeals (1989) which reversed the Examiner for failing to adequately explain why the skilled routineer in this art would have been motivated to use a particular filter medium specifically noted by one of the cited 103 references as being unacceptable by reason of its proneness to clogging. *Marinaccio* noted that no reference or combination of references appeared to teach or suggest a specific claimed modified organic polymeric skinless microporous hollow fiber filter membrane as required by the appealed claims. The Board of Appeals observed that:

“While we have no doubt that the skilled routineer in this art could modify the prior art relied upon by the examiner and obtain the appealed process, the question of obviousness under 35 USC 103 is not what a routineer could have done, but what it would have “been obvious” for such a person to do. *Ortho Kinetics Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1 USPQ 2d 1081 (Fed. Circ. 1986). The examiner has presented no supporting explanation or evidence why it would have been obvious to use the particular membranes of the appealed claims in appellants’ particular type of filtration process. The decision of the examiner is reversed.”

The examiner herein has presented no supporting evidence as to why it would have been obvious to use the particular type of claimed tennis ball retrieving attachment for its limited use of the appealed method claims 10-15 and the tennis racquet ball retrieving device of claims 1-9.

With particular reference to the vague and indefinite teachings of the cited *Musslin* patent, the Board of Appeals attention is also directed to *In re Collins* 174 USPQ 333 wherein Judge Rich concluded that:

“Reference which merely describes a thing or a process without telling how to make it or carry it out does not support holding of anticipation unless a skilled artisan could take its teachings in combination with his own knowledge of the particular art and be in possession of the invention; such a reference does not support holding of obviousness unless there is some known or obvious way to make the thing or to carry out the process.”

As to the relevancy of *Musslin* non-enabling and unlimited teachings under 35 USC 103(a) reliance is also placed upon well established legal precedence expressed by the following legal doctrine:

“It seems to us, therefore, that substantial differences exist between the teachings of the prior art and the invention here claimed. The fact that appellants have found a limited class of materials among the necessarily large number of prior art materials is itself a factor to consider as evidence of unobviousness of the claimed invention. See *In re Ruschig*, CCPA, 343 F.2d 965, 145 USPQ 274.”

A patent such as *Musslin* which teaches a vast and indefinite class of materials without any more guidance falls within that lack of suggestion or motivation as elucidated in the Board of Appeals decision of *Ex Parte Kuhn* 132 USPQ 368 wherein the Board held that:

“The examiner’s meticulous application of the *Fikenstsch* et al reference appears to at least establish that appellant is working within the broad field encompassed by this patent. Indeed by selecting specific items and conditions it might be possible to end up with a product similar to appellant’s. However, in absence of some directions or reasons for making such selection a very long experimental program might be required in order to arrive at such product. The present invention is quite specific... we are convinced that the reference had no appreciation. ...It therefore appears that appellant has made an invention within the general disclosure of *Fikentscher* et al and should be entitled to patent protection for his highly specific and limited contribution in line with such decisions as, for example; *Becket v. Coe* 1938 C.D. 55, 495 O.G. 215, 98 F. 2d 332, 38 USPQ 26; *Ex Parte Frey*, 90 USPQ 39, *Ex Parte Rawlins*, 88 USPQ 329.”

Melbye et al(all issues)

There clearly exists a glaring need to rely on some other 35 USC 103 reference or factual teaching which possibly, in combination with either *Feldi* or the French *Musslin* Patent would fairly teach and suggest all of the claimed embodiments of Appellant's invention. The *Melbye et al* patent has been combined with either *Feldi* or French *Musslin* patent teachings in both of the 35 USC 103(a) rejections for allegedly teaching the equivalency of all hook components sold under the VELCRO or SCOTCHMATE Brands. Unfortunately, the Examiner makes the same error and oversight when relying upon the *Melbye, et al* teaching, as occurred with the *Feldi* analysis. The Examiner considers the *Melbye et al* **paired** hook and loop fastener teachings of Col 1, lines 15-23, as applying to hooks alone, without recognizing that the "garment fasteners" as taught by *Melbye et al* are the same **paired** "hooks and loop fasteners" as taught by *Feldi*. Only the **paired** "hook and loop fastening system" as garment fasteners is taught by the combined *Feldi* and *Melbye, et al* teachings. These patent teachings are irrelevant to the separate and unpaired use of the either hooked or looped material or component by itself.

The Examiner's reliance upon the *Melbye, et al* Patent is also most mystifying for allegedly "showing that VELCRO and SCOTCHMATE are functional equivalents as hook-and-loop fasteners." In an attempt to bridge the gap of the unknown, the appellant is not claiming in claims 1-15 a two component "hook and loop fastener system" or "garment fastener" system as taught by either *Feldi* or *Melbye et al*. The Examiner's reliance upon the *Melbye et al* Column 1, line 15-18 background teachings of "Widely used as garment fasteners are hook-and-loop fasteners such as currently marketed under the trademark VELCRO by Velcro U.S.A. Inc and under the trademark SCOTCHMATE by 3M Company" as a basis for establishing equivalency for all SCOTCHMATE and VELCRO products or more remotely in establishing equivalency for all hooked components from all hook and loop fastening system sources is thus clearly in error.

Equivalency Assertions

An assertion of equivalency in any 35 USC 103(a) rejection requires clear substantial evidence of actual and obvious equivalency between those materials alleged to be equivalent. A

recognition of the existence of “garment fasteners” and “hook and loop fastening systems” bears no relevance to appellant’s claimed tennis ball retrieving attachment 31. A mere relationship is insufficient evidence to establish the first leg of the obvious equivalency test.<sup>10</sup> The mere relationship position becomes even more tenuous by the fact that the alleged mere relationship has been stretched from the taught paired relationship of “hook and loop fastening system” of “garment fasteners” to the untaught hook component by itself. This speculative assertion has been erroneously postulated notwithstanding a showing of record of clear and distinctive differences in the compositional make-up, the physical characteristics, the nature and character of each mating loop and hook system and how each of the paired hook and loop combination are especially designed to fasten together, as well as the various different manners in which they are manufactured and how they each individually function or perform. The mere relationship issue as taught by the art relied upon for the equivalency assertions by the Examiner extends no further than the paired two-component “fastening system” combination. The patenting of the mushroom type fasteners of *Melbye et al* made under specially designed manufacturing conditions to provide a unique mushroom type fastener as patented by *Melbye et al* provides clear evidence of the vast array of compositional differences which may be accomplished simply by altering the processing conditions under which the chemical end product (e.g. hook and loop fasteners) is manufactured. As previously mentioned, a vast amount of patent literature exists upon the manufacture of different types of fastener systems, and an even greater body of art exists upon the divergent uses of these fastener systems. (e.g.. see Exhibits B & C)

The equivalency rationale of the final rejection also fails to take into account a very important fact that the appellant is not claiming VELCRO or SCOTCHMATE garment fasteners (hook strip component and a mating nylon loop pile strip component) as “widely used in garment fasteners” as taught by *Melbye et al*. It is only when both the hooked strip and looped strips are used together (not separately) is there any meaningful interpretation of the *Melbye et al* “garment fasteners” teachings. *Melbye et al* do not contemplate the loop material or strip by itself as a garment fastener. Similarly *Melbye et al* do not contemplate the hooked material by itself as a

garment fastener, but only when the two mating hooked component and mating looped component system is combined in their intended manner and use will the two-component system serve as garment fastener as taught by *Melbye et al*. Even more remotely, *Melbye et al* do not remotely suggest or contemplate anything about a tennis ball retrieving attachment. All that may be concluded from *Melbye et al* is that the hook component bears its intended relationship to its paired and mating loop component as a garment fastener and no more.

The fact that the specially manufactured paired mating hooked component and looped component are specially designed to cooperatively interrelate, engage and fasten onto one another, and are not to be used or function independently is also verified by *Feldi*. *Feldi* clearly states that the hooked component is ineffective for tangentially engaging a conventional tennis ball wool nap so as to allow the tennis ball to be repeatedly lifted. It is not surprising (especially in view of the prior art teachings of record, as well as, the appellant's summary of the prior art teachings in the Background of the Invention teaching on page 1-4 of her specification) that *Feldi* found that only when the mating VELCRO loop and hook fastening system was used conjointly (as the system specifically intended by the manufacturers) would there then exist the essential mating combination for engaging and lifting a ball. Pursuant to these combined prior art teachings, the modified loop covered ball with the mating hooked component upon the tennis racquet, or vice versa, works only when used in combination as a paired "hook and loop fastening system" as clearly taught and suggested by both *Feldi* and *Melbye*. It is therefore important to recognize that neither *Feldi* nor *Melbye et al* suggest or teach the use only of a hooked component outside the fastening system but rather only the use of both the mating hook and mating loop components or fastening system together as a "garment fastener" or as the "ball grasper". Any extrapolation of either *Melbye et al* and *Feldi* to teach or suggest solely the use of a hooked material without its paired mating companion contradicts these patent teachings and is purely speculative and unsubstantiated in law and fact.

There exists a host of fabric fasteners produced by a host of divergent processes leading to a myriad of different fabric fastener systems, all of which are especially adapted to be used

conjointly to provide the paired fastener system. It is within this vast mosaic of prior art teachings in the face of explicit patent teachings consistently concluding that what Appellant has accomplished cannot be done coupled with suggesting diametrically opposed solutions, that Appellant discovered an amazing tennis ball retrieving attachment which, when used upon a tennis racquet to retrieve a tennis ball, yielded truly astounding results. Appellant's invention, as a whole, including the prior teachings away from Appellant's invention and totally unexpected results represent an unobvious invention under any patentability standard.

The prior art teachings relied upon in the allegedly establishing the groundwork for equivalency in the final rejection precariously rest upon the *Melbye et al* at Column 1 lines 15-22 of the "widely used garment fasteners are hook-and-loop fasteners.. currently market under the trademark VELCRO .... and SCOTCHMATE and the *Feldi* abstract teaching of "using the two components of the VELCRO or any brand hook and loop systems... using these two components in any form or manner to retrieve a tennis ball." Relying exclusively upon these inapposite teachings taken out of the context in which they are found, the Office Action conveniently overlooks the fact that these isolated teachings only have relevancy in both *Melbye et al* and *Feldi* when only both the paired hook and loop fastening system are used together. This is the paired system in which the paired hook and loop are intended to be used as "garment fasteners" as taught by both *Melbye et al* and *Feldi*. As correctly observed in *re Bausch & Lomb, Inc. v Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 230 USPQ 416 (Fed. Cir. 1986)

"A single line in a prior art reference should not be taken out of context and relied upon with the benefit of hindsight to show obviousness."

Contrary to these very explicit paired hook and loop fastening system teachings of both *Feldi* and *Melbye et al*, the Examiner in the final rejection has carefully dissected from the necessary and essential paired component hook and loop system, the hook component (apart from the required paired loop component), and presumptively jumped to the non-sequestur conclusion that these teachings establish an art recognized equivalency between the ever different hook of every different hook of all hook and loop fastener systems irrespective of their manufacture and

inexpensive of their diverse shape, characterization, composition and function. A myriad of different types of paired hook and loop fastener systems produced upon a host of different processing or manufacturing conditions which are designed to yield different types of fastener systems exist. To isolate any mating hook from its mating loop of the paired fastening system is analogous to having a marriage without the bride.

*Melbye et al and French Musslin or Feldi Combination*

The combination of *Melbye, et al* with either the French *Musslin* patent or *Feldi* rests upon erroneous interpretation of the *Melbye, et al* background of the invention's teachings and complete disregard to what *Melbye, et al* actually teaches. *Melbye, et al* discloses a mushroom fastener which fastens together by wedging and interlocking the mushroom heads together as shown in the *Melbye et al Figure 2*. Any combination of *Feldi* and *Melbye et al* under 35 USC 103(a) must necessarily rely upon the "garment fastener" or two component hook and loop fastening system combination of a mating hooked component and a mating looped material and no more. *Melbye et al* allegedly discloses a SCOTCHMATE product as a garment fastener but teach a specially designed and configured mushroom-type fastener system of two matching pedestalled mushroom headed fasteners (stems with a mushroom head) in which at least three units are required to interlock with one another or fasten together as shown in figure 2 of *Melbye, et al*. In direct contradiction to the Examiner's position that equivalency may be presumed upon the basis of a mere relationship, the mushroom type fasteners of *Melbye, et al* are taught as reportedly provide superior and patentable interlocking fastening properties when used as a paired combination of three or more interfacing and interlocking heads, as disclosed in *Melbye, et al* figure 2. The interlocking mushroom head system of *Melbye, et al* is obviously substantially different in structure and function from the uniquely distinctive, monofilament hooks as claimed herein by the Appellant. This may be seen by comparing Figure 2 of *Melbye et al* with Appellant's Figures 4 and 5. As taught in Col. 4, lines 11-48 of *Melbye, et al*, even amongst the mushroom type fasteners there exists a broad spectrum of fastening properties, all of which contradict the underlying rationale that all hook components may be presumed to be the actual

and obvious equivalents of one another. The composition, physical characteristics, such as break force, shear strength, T-Peel and manufacture are taught by *Melbye, et al* were deemed to be patentably and functionally distinguishable from all other fastener systems, as evident by the issuance of the *Melbye et al* patent claims thereto. It is important to recognize the *Melbye et al* extol the uniqueness and patentability of their mushroom fasteners over all other mushroom type fasteners. Much of these differences in birefringence and functional properties is accomplished by the unique processing conditions by which they are made. If these differences exist amongst the fastening systems of *Melbye et al*, is it logical without any supportive art proof to assume that all hook materials irrespective to their manufacturers or compositional make-up are equivalent to one another?

The final rejection completely disregards Appellant's Rule 132 Affidavit of record showing *Melbye, et al* mushroom strips to be completely ineffective by stating that "the Affidavit is unpersuasive because it is not directed to the aspects on which reliance was made." Contrary to the Examiner's assertion, the mere fact that the two hook and loop components serve as a hook and loop fastening system has no relevancy whatsoever as to the issue of an unknown tennis ball retrieving attachment, or more remotely, as to whether or not the claimed unique pre-shrunk nylon hooks of highly specific hook diameter, hook length, hook depth, hook width, spirally arranged in repetitive rows in prescribed numbers as claimed can be deemed to be equivalent to all other known hooks including the *Melbye et al* mushroom type fasteners. Appellant's Rule 132 Affidavit of Record clearly states that the mushroom type strips of *Melbye et al* have no efficacy in tangentially attaching to and lifting tennis balls.

It is accordingly most important to understand that when *Melbye et al* refers to the VELCRO and SCOTCHMATE hook and loop garment fasteners in Col., lines 15-23, *Melbye et al* refers only to the conjoint use of both the mating hooked and mating loop components as "garment fasteners". The *Melbye et al* Patent teachings cannot be construed as meaning all SCOTCHMATE and all VELCRO hooked materials are equivalent to one another. Both the mating hook component and the mating looped component are required to provide the



paired “garment fastener” use, as taught by *Melbye et al.* The Examiner’s reliance upon *Melbye et al.* for allegedly establishing equivalency between all fastener combinations including all VELCRO and SCOTCHMATE products is thus clearly in error.

*Appellant’s Alleged Admission of Equivalency* (Both Rejections)

It is not surprising that the 35 USC 103 rejections must rely upon appellant’s own teachings and erroneous position of appellant’s alleged admission of equivalency. None of the patents relied upon in the 35 USC 103(a) rejections suggest or teach equivalency between all hook components of the various different combinations of fastening systems. The Examiner has been consistently challenged by the complete lack of factual evidence which allegedly shows or proves that equivalency exists amongst all known hook components any other use than its use in a paired hook and loop fastening combination. There exists no such showing and accordingly the office action relies upon an alleged admission of equivalency to supply facts clearly untaught by the prior art. Merely because they are part of a hook and loop fastening system which when used together will serve as a garment fastener (*Melbye et al.*) or ball grasper (*Feldi*) as they were specially designed and matingly adapted to hook and loop onto one another (i.e. the “fastening system”) does not establish equivalency for anything other than the combined paired hook and loop fastening system. This does not establish a different relationship of an unclaimed combination or unrelated combination for an entirely different purpose.

The Examiner deems that the appellant has admitted the equivalency of her tennis ball retrieving attachment with all other ball retriever attachments when in fact no such admission was ever made. Appellant’s Rule 132 Affidavit of Record, the tabulated comparative test results of Appellant’s specifications, the teachings of the prior art relied upon in the final rejection and Appellant’s teachings in her specifications clearly substantiates that the hook component (apart from the hook and loop two component system) are neither the actual or obvious equivalent to one another, nor do they function alone in substantially the same manner to produce substantially the same results. A comparison between appellant’s specification Figure 4 and Figure 4 of *Melbye et al.* clearly reveals this fact.

In order for equivalency to exist there must exist actual and obvious equivalency between that which is alleged to be equivalent.<sup>10</sup> As shown above, a mere relationship does not establish that two different elements are the obvious equivalent. The second leg of equivalency is the need to establish actual equivalency. An integral part of any equivalency position is that the alleged equivalents must necessarily function in the same manner to produce the same or substantially the same result.<sup>10</sup> Appellant tested *Melbye et al* and compared it with the claimed embodiments of appellant's invention which test results as attested in Appellant's Rule 132 Affidavit clearly state and show that the mushroom shaped component, (without its mating strip component of the *Melbye et al* Patent) was totally incapable of engaging and lifting a tennis ball. The *Melbye et al* fastener is obviously not an equivalent to the unique and highly specific monofilament preshrunken nylon hooks as uniquely narrowly defined by appellant's appealed claims 1-15. If an alleged equivalent is incapable of yielding an equivalent function, equivalency cannot exist. How can the office action in view of unrefuted and clear evidence whatsoever showing non-equivalency between hooked materials maintain without any substantiating evidence that all hooked materials are equivalent? Actual and obvious equivalency legally means performing in substantially the same manner to yield substantially the same result. One performs (appellant's discovery) and the other (*Melbye et al*) does not perform. Equivalency does not exist. Appellant also tested a host of other monofilament hooked materials and reported selective test results and, as reported, found that such an alleged equivalency does not, in fact, exist amongst a host of hooked components.

Appellant is entitled to rely upon the very art cited by the examiner in both 35 USC 103(a) rejections clearly reveals that equivalency does not exist (i.e. *Feldi* and *Urwin*) conclude that hook component cannot accomplish what appellant's claimed invention of claims 1-15 accomplish. Although the appellant studied the efficacy of various different hook components amongst the host of available sources and consistent with these prior art teachings (see *Feldi*, *Urwin*, etc), none of those other hook components performed in substantially the same manner (i.e. tangential engagement) to produce substantially the same result (i.e. reportedly lift 4-6 times own weight for all major brand tennis balls) as the claimed subject matter of appellant's claims 1-15. Appellant's

comparative example tests the tennis ball retrieving efficacy of various different hook component types and clearly shows that the nylon monofilament hooked material of Appellant's claimed attachment (claims 1-15) is neither the actual nor the obvious equivalent to any other hooked material. If appellant admitted the equivalence of her ball retrieving attachment to known attachments, then why would she file a patent application and claiming a unique tennis ball retrieving attachment and its use to tangentially contact and retrieve all tennis balls. There accordingly exists no factual or legal bases as required under 35 USC 103(a) to rely upon Appellant's alleged admission of the prior art in the cited *Feldi* or *Musslin* and either in view of *Melbye* against appellant's claims 1-15.

As evidenced by the necessity of both Final Rejections to speculative infer certain matters<sup>11</sup> (clearly untaught by the prior art by relying the Appellant's findings as an alleged admission of equivalency), the final rejection is falsely predicated upon the use of Appellant's teachings to establish those untaught claimed embodiments of her invention. At the time of her invention, there existed no prior art teachings or suggestions or motivations which would guide or enable the Appellant to create the unique claimed embodiments of her invention. Only through her unexpected discovery of a unique tennis ball retrieving attachment 30 equipped with a highly specific hooked material 31 (of prescribed compositional and physical attributes) possessing a unique tennis ball nap N interrelationship and affinity (notwithstanding prior art clearly discouraging and leading her away from the claimed embodiments of her invention) was the Appellant able to accomplish the unique unexpected and unobvious attributes of her claimed invention herein.

An untaught, non-sequitur doctrine of equivalents a mistaken alleged admission against interest and regarding appellant's own teachings as prior art forms the entire basis for attempting to read undisclosed and untaught claimed limitations into the prior art teachings of record. Silence of the prior art is not a proper substitute for adequate facts from which conclusions of obviousness may justifiably follow.

*Appellant's Discoveries are Untaught* (All issues)

The compositional (preshrunk monofilaments hooks of claim 1, lines 6-7 and claim 4, lines 8-9; and disclosure page 8, line 17; page 9, line 17; and page 11, lines 8-12) and structural characteristics of the hooked materials 31 (e.g. average hook height  $h$ , width  $w$ , depth  $H_d$ , and diameter  $d$  of the monofilament hook 31) were unexpectedly found by the inventor to have a direct and unique bearing upon the efficacy of an unique and untaught attachment 30 equipped with a monofilament hooked material 31 which effectively retrieves tennis balls T upon tangential contact. As mentioned, this is a one-of-a-kind ball retrieving attachment 30 which was solely discovered from an unusual source by Appellant and solely found to possess a totally unexpected affinity for engaging and holding onto a nap N of a tennis ball T. The ability to penetrate the nap N, to cooperatively engage the nap N upon tangential contact and maintain its hooking structure so as to repetitively lift all major brands of tennis balls T represents an unexpected result discovered by appellant over what has been taught and suggested by the prior art of record.

All of the findings reported in Appellant's example including those of Tables 1,2 and 3 are Appellant's own discoveries and findings. The unexpected discovery of the claimed attachment 30 equipped with the unique monofilament hooks 31 exhibit a four fold or greater tenacity over its closest rival of which all involve findings exclusively discovered and made by Appellant. The claimed monofilament hook characterizations and measurements and the understanding of the interrelationship with the tennis ball nap are Appellant's findings and not the prior art.

There would exist no need for Appellant to file her patent application if she deemed her ball retrieving attachment 30 to be equivalent to those known ball retrieving devices of the prior art. Throughout Appellant's specifications the uniqueness and unexpected efficacy of this one-of-a-kind hooked material has been stressed by Appellant (e.g. see Appellant's specification page 8, line 17; page 10, line example; and Tables 1-3 reports, page 15, line 12; page 16, line 12). As discovered by Appellant, as shown in her example, and as verified in Appellant's Rule 132 Affidavit, only one ball retrieving attachment 30 as discovered by Appellant and equipped with only one highly specialized hooked material 31 (as only claimed in all of the appealed claims) met

these unique claimed prerequisites and only one attachment **30** was capable upon tangential contact to repeatedly hook and lift all of the major tennis ball brands. As may be observed, only this unique hooked material **31** customarily manufactured and adapted for paired use in combination with its mating loop strip **L** (as shown in Figures 3 ) for totally different industrial applications (i.e. as a hook and loop fastener system) fulfills these most stringent and uncommon claimed requirements of Appellant's claims. The tabulated and reported results beginning on page 15, line 12 of Appellant's Specifications attests to the uniqueness and superiority of the monofilament hooked fastener as prescribed by Appellant's Claims 1-15 and particularly of Claims 4-8 and 10-15. These facts are disclosures of Appellant; not of the prior art.

Figure 2B and the partial cross sectional view of Figure 4 depict the unique tangential contact as claimed in all claims and engagement of the spirally aligned monofilament **31** hooks of the hooked material upon the tennis ball nap **N**. The spiral configuration of the monofilament hooks is illustrated in particular by Figures 3 and 4. Figure 4 is an enlarged view depicting the tangential engagement of the monofilament hooks with the tennis ball nap or pile **N**. Figure 5 is an enlarged depiction of the monofilament hook **31** showing in detail the hook height (**h**), the hook depth **H<sub>d</sub>** and the hook width **w** and hook diameter **d**, all of which play an integral part in the unique cooperative interrelationship between the highly specific and uncommon monofilament hooked material claimed herein and the nap **N** of the tennis ball **T** discovered solely by Appellant.

The presumed obviousness conclusion remains totally unwarranted and unsubstantiated by the facts of record and rests solely upon Appellant's own teachings to guide the ordinary artisan through a mosaic of discordant patent teachings. Appellant has difficulty in rectifying the reliance of Appellant's own teachings (an alleged admission of prior art equivalency) with the decision of *In re Aufhauser* 158 USPQ which held:

"While, as above pointed out, wax-polyethylene blends were known to the art, and while it was also known to the art that wax or polyethylene could be irradiated individually, the specific issue before us is whether irradiating a blend of wax and polyethylene, as taught by appellant, for the purpose of preventing separation of the wax and polyethylene components was obvious from the disclosures of the prior art. The fundamental error of

the board and the examiner seems to us to have arisen from their analysis of the art as if it contained the knowledge of appellant's invention. In other words, they proceeded to combine the prior art as if appellant's invention was included therein as a part of the knowledge possessed by one of ordinary skill in the art. Such an analysis does not comport with that required by *Graham v. John Deere Co.*, supra. Instead, here as in *United States v. Adams*, 383 U.S. 39, 148 USPQ 479 (1966), what appellant had done was to *observe* an existing problem in the art which had not been solved by the prior art and then to *combine* individually old concepts to solve that problem."

The prior art, as a whole, and Appellant's claimed invention, as a whole, have not been duly assessed and evaluated as required under the Deere decision. The fact that the claimed invention was unknown and yielded truly unexpected results has not received any consideration; and this fact alone should be acknowledged as being enough to rebut any *prima facie* case of obviousness.

#### **Paragraph 4 - 35 USC 103 Rejection**

In paragraph 4 of the final rejection, claims 8, 11 and 13-15 stand finally rejected under 35 USC 103(a) as being unpatentable over *Feldi, Musslin, Melbye et al* and Appellant's admission to the prior art in her specifications as applied above in view of the *Urwin Patent*.

The paragraph 4 final rejection relies upon the same combination of patents and appellant's alleged admission as the paragraph 2 final rejection above except for the addition of *Urwin* and thus the above arguments apply with equal merit to this 35 USC 103(a) rejection.

The wording of the aforementioned rejection of claims 8, 11 and 13-15 apparently concludes that when all of the cited patent teachings are somehow mystically gleaned by randomly selecting isolated and discordant passages from each of the patents, then using Appellant's claims and disclosure as a template, then by fortuitously combining these randomly chosen passages in a manner taken out of the context in which they are found (singularly and collectively) and then by compounding the lack of prior art teachings by a reliance upon an alleged admission against interest by Appellant (relying upon Appellant's claims as a template) to bridge an art gap totally lacking and untaught from these randomly gleaned teachings, then a *prima facie* case of obviousness mystically exists. This constitutes nothing more than hindsight reconstruction of prior art and clear reliance upon Appellant's own teachings to establish clearly untaught and

unsuggested facts necessarily needed for any proper *prima facie* case of obviousness under 35 USC 103(a).

The Examiner additionally relies upon the *Urwin Patent* in the final rejection of claims 8, 11 and 13-15 for allegedly showing it would be obvious to position Appellant's unique tennis ball retrieving attachment "anywhere along the outer surface of the racquet frame". References or patents, when combined with one another, must take into account what the references (i.e. the patents), singularly and collectively, *as a whole*, fairly teach and suggest to one of ordinary skill. A skilled artisan does not read the *Urwin* patent in a vacuum for isolated passages which in view of another isolated patent passage, may bear some obscure relationship towards Appellant's claimed invention, but rather skilled artisans are motivated for that what meaning any of the cited patents as a whole may suggest or teach to one of ordinary skill.<sup>1, 4 & 11</sup> What is essential to the operation and function of the *Urwin* patent cannot be dismissed as unnecessary teachings when *Urwin* is combined with other patents in a 35 USC 102(a) rejection.<sup>1</sup> When *Urwin* teaches something that cannot be done without enveloping and grasping the ball, such patent teachings in a reference combination under 35 USC 103(a) cannot be deemed to suggest and motivate an artisan towards a tangential contacting and engaging tennis ball retriever.<sup>12</sup> Artisans are not motivated by randomly gleaned, obscure and isolated passages which are not only discordant with what the patent itself teaches, but also discordant with those teachings of another patent with which these discordant passages have been combined for 35 USC 102(a) purposes. The final rejection accordingly fails to take into account the fact that the *Urwin* teachings, as a whole, *Urwin* actually reinforces Appellant's position that it would be unobvious to use Appellant's unique and unknown tennis ball retrieving attachment 30 in the manner in which it is used to tangentially contact and engage a tennis ball so as to permit the repetitive retrieval of all major tennis ball brands. Not only does appellant's claimed attachment 30 retrieve all tennis balls but also 4-6 fold the tennis ball's weight.<sup>7</sup> All of this has been unexpectedly discovered by appellant without destroying the tennis ball nap or adversely affecting the delicate play and balance of the tennis racquet.

What motivation (without any knowledge of Appellant's invention) arises to one of ordinary skill having knowledge of the *Urwin* patent teachings as a whole to remotely perceive, much less discover, the claimed tangential tennis ball retrieving embodiments of Appellant's claims 8, 11 and 13-15? The *Urwin* motivation is that no hooked material by itself cannot tangentially engage and lift a tennis ball, but if you change the ball retrieving attachment to "an arcuate tennis ball grasper of a contour mating onto the contour or curve of the tennis ball", then you can effectively lift the tennis ball. *Urwin* clearly directs and motivates the artisan away<sup>12</sup> from the unknown discovery of a uniquely different tennis ball retrieving attachment used in an entirely different manner from which *Urwin* teaches to achieve a totally unexpected end result all of which represents under all existing patent standards an unobvious invention.<sup>7</sup> The use and reliance upon *Urwin* in the 35 USC 103(a) rejection based upon *Feldi* (same teaching away problem) or *Musslin* in combination with *Melbye et al* is clearly in error since it destroys the essence of the *Urwin* teachings, as well as rendering *Urwin* unfit for its intended purpose.<sup>1</sup> The *Urwin* patent combination, as applied, destroys the mode of operation and entire underlying purpose of the *Urwin* patent teachings.

The mere fact that *Urwin* uses a paired hook and loop fastening system to attach the "arcuate frame having a concave interior surface configuration in similar shape to arc on the spherical surface of a tennis ball" (e.g. see *Urwin* Col. 5, lines 37-39) has no relevancy under 35 USC 103(a) to Appellant's claims 8, 11 and 13-15 or the establishment of grounds for a *prima facie* case of obviousness herein. The gripping means (30 and 40) attached at a one o'clock position and butt end of the racquet are not designed for direct tennis ball contact, but rather provides a paired hook and loop fastening system which allows the butt end gripping member 10 to be removably attached to the racquet from the gripping means. What motivation does the *Urwin* teachings, as a whole, have towards the establishment of a *prima facie* case of obviousness? How does Appellant's claimed tangential tennis ball retrieving attachment 30 in any form or manner relate to the essential graspingly grip the tennis ball as required by *Urwin*? Contrary to the Examiner's position, the *Urwin* teachings, in conjunction with either *Feldi*,



*Musslin* or *Melbye, et al* provide clear evidence of the absence of any *prima facie* case of obviousness. Both *Feldi* and *Urwin* conclude that what Appellant's claims as her invention (tangential contact and retrieval) cannot be done. An appellant is "entitled to rely on the fact that the most specific teaching cited by the examiner, uncontradicted by the art of record, led away from what appellant claimed."<sup>11</sup> *Musslin* leaves the artisan with nothing but a vast number of different types of unidentified materials falling within its all encompassing teachings device. *Musslin* thus fails to provide any guidance whatsoever and is totally negated by the more current teachings of both *Feldi* and *Urwin*. *Melbye, et al* fails to provide any guidance or motivation by disclosing an inapposite mushroom type fastening system (which is saliently different and **also DOES NOT WORK**) coupled with teachings disclosing that a broad array of diversified products with differing hook and loop fastening system combinations may be produced by varying the processing conditions of manufacture (e.g. molecular orientation by cooling of col. 3, lines 23-26, 40-52, and col. 5, lines 1-7. Example 1: Tables 1 and 11 etc. as taught by *Melbye et al*). *Melbye, et al* teach and contradict the essence of the Examiner's unsupported conclusion that equivalency may be arbitrarily assumed by reason that the paired hook and loop fastening systems are manufactured and designed to fasten together. Even amongst the hook mushroom type fasteners of *Melbye et al*, substantial differences arise by reason of manufacturing conditions, molecular orientation, structure and chemical composition. Equivalency may not be presumed or established upon the basis of a mere relationship or appellant's own findings. Lastly, the claimed unexpected results of Appellant's invention could not be predicted from the prior art teachings, as a whole, which collectively taught Appellant's claims 8, 11 and 13-15 could not be done.<sup>6 & 7</sup>

*Urwin* has been relied upon for allegedly teaching that the hook and loop fasteners may be placed anywhere along the outer surface of the racquet frame. Appellant is not claiming a ball retrieving attachment comprised of a paired hook and loop fastener system placed upon a shoulder of a tennis racquet. Appellant's claims 8, 11 and 13-15 are directed towards a unique and unknown ball retrieving attachment in the form of a strip adhesively attached to an outer surface of a tennis racquet and its use, which because of its uniqueness, including the claimed

monofilament hook structure, possesses a unique undisclosed and unknown ability simply upon tangential contact to engage the nap and to lift repetitively all major brands of tennis balls. *Urwin* cannot do this and clearly requires a cumbersome, protruding ball grasping attachment which follows the contour of the tennis ball cover so as to envelope the ball, as opposed to the claimed “tangentially contacting the grounded” tennis ball. In contrast to Appellant’s claims 8, 11 and 13-15 of a ball retrieving strip attached to the shoulder of the tennis racquet in a streamlined fashion from a nine o’clock position to about a three o’clock position, *Urwin* attaches a bulky, protruding ball shaped gripping member 10 to the tennis racquet using the hook and loop gripping means 30, 40, 24 and 26 so as to removably attach and detach the ball gripper 10 from the racquet. The most appropriate position for not interfering with tennis play is at the butt end of the *Urwin* handle as shown in *Urwin* Figure 6. Any other cumbersome and unbalanced placement upon the racquet would adversely effect the play of the more avid and talented tennis player. *Urwin* also teaches in col. 4, lines 11-13 “that the location just offset from the top provides the most effective location for using the tennis racquet”, (i.e. at one o’clock as shown in *Urwin* Figure 1). It is not surprising that *Urwin*’s ball gripper 10 includes removable hook and loop attaching means (30, 40, 24 and 26) so that it may be easily removed during tennis play. In complete contrast to *Urwin*’s enveloping of the tennis ball, the claimed strip of Appellant’s claims 8, 11 and 13-15 allows for only tangential contact between the attachment and the tennis ball as claimed. The claimed strip applied and following the contour of the tennis racquet shoulder only permits tangential contact while also allowing the tennis racquet in tennis play to aerodynamically slice through the air without hindering or adversely affecting play.

#### *Method Claims 10-15 - Patentability*

The method claims 10-15 provide a method for retrieving a grounded tennis ball T with a tennis racquet 2 equipped with a unique ball retrieving attachment 30 attached along an outer peripheral edge of a shoulder 12 of the tennis racquet 2 with the hooked material positioned (e.g. see Figures 1, 2A, 2B, 6 & 7) thereupon at a retrieving position for tangentially engaging and lifting a grounded tennis ball T upon tangential contact therewith. (see Figures 2B & 4)

The initial unknown step (claim 10) of providing as a tennis ball retrieving attachment **30** a strip of a hooked material **31** having a pressure sensitive adhesive **33** applied to a resilient backing member **32** equipped with a plurality of pre-shrunk nylon monofilament hooks **31** of an average monofilament diameter **d** of at least 8.0 mil, an average hook height **h** of at least 1.85 mm, an average hook width **w** of at least 1.0 mm, and an average hook depth **H<sub>d</sub>** of at least 0.6 mm, with the hooks being of a spiral configuration arranged in repetitive rows of at least 250 hooks per square inch claims a narrowly defined and unique pre-shrunk nylon hooks **31** which when applied to the outer peripheral edge **12** of the tennis racquet's shoulder **11** at the retrieving position of step (b) so as to unexpectedly allow the uniquely distinctive ball retrieving attachment **30** including monofilament hooks **31** of the strip **30** upon tangential contact with the grounded tennis ball **T** (as shown in Figures 2B) to engage onto the tennis ball nap **N** to consistently lift the hooked tennis ball nap **N** ( as shown in Figures 2B & 4) to a ball retrieving position involves a completely unknown steps of a tennis ball retrieving method. These essential prerequisites, as claimed, were unknown. The fact that the tangentially engaged tennis ball **T** may then be lifted and easily retrieved (without fail) from the strip without stooping or bending involves the unknown. An important aspect of Appellant's invention rests upon a uniquely different attachment **30** of monofilament hooks **31** characterized by a narrowly defined strip of monofilament hooks **31** possessing uncommonly different characteristics and capabilities from all others. There exists an extraordinary and uncommonly different cooperative interrelationship between the tennis ball of nap **N** of a standard tennis ball **T** and Appellant's claimed tennis ball attachment **30** which permit the claimed unexpected superior efficacy of Appellant's invention to be achieved. The unobviousness of the claimed method of providing an uncommon ball retrieving attachment **30** having saliently different structural characteristics (i.e. diameter, height, width, hook depth) and that these saliently different and unique characteristics yielded a unique and unexpected result heretofore unknown and untaught is clearly evident from the cited patents of record. The method claims 10-15 require the discovery of an uncommon and unknown tennis ball

retrieving attachment 30 with a unique ability to tenaciously engage a tennis ball nap and retrieve all tennis balls by tangential contact therewith.

The final rejection of appellant's method claims 10-15 presupposes that the skilled artisan would be motivated upon the basis of the cited patents to equip a tennis racquet with an unknown tennis ball attachment (unknown to have an unexpected and unique affinity to a tennis ball nap) comprised of a strip of a saliently different claimed hooked material structure from what is disclosed in any of the combined patent teachings by applying the pressure sensitive strip of the ball retrieving attachment 10 to the outer peripheral edge of the shoulder of the tennis racquet, then by "tangentially contacting the tennis ball", so as to engage and hook the wool nap of the grounded tennis ball onto the nylon monofilament hooked material, a tennis player would then be able to repetitively engage, lift and consistently retrieve all brands of tennis balls thereby. There exists no motivation to discover such an unknown tennis ball retrieving attachment much less effectively use such a device or to remotely comprehend that what the prior art says cannot be done, can be done. Assuming *arguendo* that a *prima facie* case of obviousness exists, the unexpected results, especially in light of prior teachings (e.g. *Feldi* and *Urwin*) saying it cannot be done provides an unrefuted and clear rebuttal of any such *prima facie* case of obviousness.

How can an undisclosed and untaught ball retrieving attachment be presumed to be known when the collective teachings (i.e. *Urwin*, *Feldi*, *Musslin* and *Melbye, et al*) of the combined patents fail to teach the untaught and essential embodiments of such tennis ball retrieving attachment exists?<sup>11</sup> How can a tangential contacting ball lifting attachment be presumed to be obvious when, in fact, the very art which is relied upon for the assumed "*prima facie* case of obviousness" teaches<sup>12</sup> that you cannot effectively retrieve tennis balls upon tangential contact and that your choices are to either alter the tennis ball retrieving attachment to the curvature of the tennis ball surface (*Urwin*) or completely change the tennis ball cover to a hook and loop fastening system (e.g. *Feldi*), and especially in view that none of the cited patents bear any relevancy to the unknown tennis ball retrieving attachment of Appellant's claims 10-15? As aptly held in the decision of *In re Dow Chemical Co.* 837 F.2d469, 5 UPSQ2d 1529 (Fed.Cir. 1988):

“Recognition of need, and difficulties encountered by those skilled in the field, are classical indicia of unobviousness.”

If no one knows of the tennis ball retrieving attachment as prescribed by Appellant’s method claims 10-15, how can it be presumed obvious to discover the unknown and use the unknown tennis ball retrieving attachment in the methodology as prescribed by Appellant’s method claims 10-15? Is it obvious to use an unknown ball retrieving attachment to achieve unexpected ball retrieving results in the face of prior art teachings which collectively teach it cannot be done?

These facts herein are reminiscent of *In re Buehler* - 185 USPQ 781 in which the CCPA noted that:

“Appellant’s claimed method, however, involves doing what Clark tries to avoid.... Appellant has invented a method...when the prior art (Clark) strongly suggests that such method would produce.... unacceptable results. This is the very antithesis of obviousness....The prior art...does not teach or even hint at appellant’s discovery...”

*Legal Support of Unobviousness Conclusion* (all rejections)

The final rejection Appellant’s claims 1-15 is flawed by a failure to follow the M.P.E.P. guidelines, the statutory requirements, and established case law coupled with the absence of several crucial elements which are necessarily essential to establish any valid rejection claims or *prima facie* case of obviousness involving a combination of references under 35 USC 103(a). The final rejection (as pointed out in previous response by Appellant) fails to follow those obviousness guidelines as clearly established by the Manual of Patent Examination and Procedures. These unfollowed guidelines include:

1. A failure to take in consideration Appellant’s claimed invention, as a whole, including all the claimed elements of the invention, as well as the unique and unexpected results that have been achieved as a result of the Appellant’s unobvious invention.
2. A failure to provide the necessary factual background (including all the claimed elements) in support of a valid *prima facie* case of obviousness.

3. A failure to appraise and properly evaluate the individual and collective patent teachings of record as a whole, including those patents relied upon in the 35 USC 103(a) rejections.
4. A failure to apply the appropriate legal standards and considerations in concluding that all of Appellant's rejected claims are obvious under 35 USC 103(a).

A necessary prerequisite in establishing *prima facie* case obviousness in any claimed invention requires that all the claimed limitations must be suggested or taught by the prior art (e.g. see M.P.E.P. 214303.03 In re: Royka, 490 F.2D 981,18/0USPQ/58,(CCPA/1974) without any reliance upon Appellant's findings to supply matters untaught by the prior art:

"All of the disclosures in a reference must be evaluated for what they fairly teach one or ordinary skill in the art... .. when all of the disclosures in a reference are considered, the overall suggestion to emerge from the prior art reference may be contrary to that which might appear from an isolated portion of the reference." In re *Langer et al*, 175 USPQ 169.

Equally important is to recognize that the claimed invention includes not only those claimed embodiments recited in the claim, but also the unexpected results which are achieved or provided by an invention (i.e. the invention as a whole).<sup>7</sup> Appellant's claims clearly point out and distinctly claim that the invention relies upon a unique and unknown tennis ball retrieving attachment equipped with a highly unique and distinctive characterization of a one-of-a-kind hooking material which is capable merely upon tangential contact with a tennis ball nap to engage and lift repetitively all major brands of tennis balls without damaging the tennis ball. This is truly an unexpected and untaught result which, in light of the very art relied upon in the final rejection, could not be accomplished.

The primary reference (*Feldi*) and a necessary secondary reference (*Urwin*) in the 35 USC 103(a) rejection of claims 8, 11 and 13-15 clearly teaches that what the Appellant has accomplished cannot be accomplished in the manner in which it was accomplished. Even if it were deemed that sufficient facts existed upon the basis of the combined patent teachings to establish a *prima facie* case of obviousness, then the unexpected results of the Appellant's invention (especially in light of the patent teachings which very explicitly say that what Appellant

has accomplished cannot be done) constitutes more than sufficient grounds to override any such *prima facie* case that might have existed.

In the 35 USC 103(a) rejections of record, there exist no teaching of a tennis ball retrieving attachment equipped with a very narrowly defined, specific and unique different hooked material. Neither *Feldi* nor *Musslin* nor *Melbye et al* in the 35 USC103(a) rejection of claims 1-7, 9, 10, and 12 disclose or remotely contemplate an attachment meeting such unusual claimed prerequistal elements. The binding of such a tennis ball retrieving attachment and characterization all involve unexpected findings solely known to appellant. *Urwin* as applied in combination with *Feldi* or *Musslin* and *Melbye et al* in the final 35 USC103(a) rejection of claims 8, 11, and 13-15 recognizes the complete paucity of the prior art in disclosing or suggesting this essential claimed embodiment of appellants tennis ball retrieving attachment and even more unexpectedly its unexpected efficiency in retrieving tennis balls via tangented contact, engagement and lifting of a tennis ball nap. The requirements and the unexpected results are appellants contributing of matters neither known or expected upon the basis of the cited prior art teachings (i.e. *Feldi*, *Musslin*, *Melbye et al* and *Urwin*).

The final rejection fails not only to provide the necessary factual background to support a valid 35 USC 103(a) rejection, but also fails to properly evaluate what the individual teachings of the patent of record, as a whole, fairly teach and suggest to the artisan of ordinary skill, as well as what the collective or combined teachings of the cited patents (as a whole) may be deemed to fairly teach and suggest to an ordinary artisan. The whole thrust of the Examiner's position rests in an attempt to establish that the claimed unique and distinctive monofilament nylon ball retrieving attachment unexpectedly discovered by Appellant was known to the art by relying primarily upon two patents (*Feldi and Melbye et al*), both of which fail to teach what the Examiner alleges they teach, much less the erroneous factual conclusions that all hooked materials (irrespective of their structure, their chemical composition, their molecular character, their method of manufacture, etc.) may legally be regarded as equivalents. The manner in which prior art

teachings have been gleaned for discordant teachings flies directly in the face of a long established case law that:

“A necessary corollary is that all words in the claim must be meaningfully considered before judging the patentability of any given claim against the prior art (e.g. see in re: Wilson 165 USPQ 494 CCPA1970).”

*Feldi* and *Melbye et al* do not provide any factual or legal grounds for the equivalency position as relied upon in the final rejection of Appellant’s claims.<sup>10</sup> As pointed above, the claimed ball retrieving attachment bears no equivalent relationship to the hook and loop garment fastener of *Urwin* or the paired hook and loop fastening system of *Feldi*.

The Examiner’s equivalency position rests upon a gleaning of the patent literature as a grounds for establishing a relationship between the cited art and the undisclosed claimed embodiments of Appellant’s claimed tennis ball retrieving attachment. Broad indelible words and phrases such as the paired “hook and loop fastening system” of *Feldi*, the “garment fasteners” of *Melbye et al*, and the paired VELCRO and SCOTCHMATE hook and loop fasteners have all been gleaned from the cited patents (irrespective of the fact that the patents’ teachings are inapposite to appellant’s claims) in an attempt to establish a mere relationship. Any attempt to establish equivalency just because of a known relationship (even though they don’t work, such as in *Melbye et al*, *Urwin* and *Feldi*, cannot be legally reconciled with the well established legal doctrine:

“...A mere known relationship between acetals and esters as disclosed by the isolated portion of Enk upon which the board relied is insufficient to support the rejection. As distinguished from a disclosure of equivalents, the disclosure of a known relationship does nothing more than teach that it would have been obvious to try, which is insufficient under section 103. In re Lindell, 55 CCPA 707, 385 F.2d 453, 155 USPQ 521 (1967). Many compounds have a known relationship but are not equivalents for substitution in different reactions. A mere relationship is an insufficient basis for the necessary predictability of success to sustain a rejection under section 103.” See In re Naylor 54 CCPA 902, 369 F.2d 765, 152 USPQ 106 (1966) and In re Mercier - 185 USPQ 774.



As also stated in ex parte Price et al 150 USPQ 467 (P.O.B of App. - 1966):

“The examiner states that oxygen and sulfur are regarded as equivalent in this art. This is always an attractive generality but we are not convinced that it disposes of the instant issue of obviousness. The secondary references do not convince us that the particular substitution involved here would be obvious.”

Even more importantly, the whole equivalency argument by the Examiner rests totally upon what is only known to Appellant (alleged admission of equivalency). This is legally inappropriate as firmly established in the decision *In re Ruff* (1958 45 Cust & Pat App (Pat) 1037,256 F2d 590, 118 USPQ 340 which stated:

“To rely on equivalents known only to applicant to establish obviousness is to assume that his disclosure is part of prior art; this is contradictory to SEC 35 USCS 103 wherein test laid down is whether difference between what is claimed and prior art would have been obvious to one of ordinary skill in art at time invention was made. Actual equivalence is not enough to justify refusal of patent on one member of group when another member is in prior art; equivalence must be disclosed in prior art or be obvious within terms of SEC 35 USCS 103.”

The equivalency standard requires not only that *obviousness equivalency* exists but also that they must be the *actual equivalents* to one another. The “test of actual equivalency is whether substituted element operates in substantially same way to produce substantially same result as element replaced” *In re Shaffer* 108 USPQ 326 (CCPA 1956). None of the patents or references relied upon by the Examiner disclose appellant’s claimed tennis ball retrieving attachment and the method of its use. The disclosed ball retrievers of the prior art all fail to meet this standard of “operating in substantially some way to produce substantially some result as element replaced.” None of the cited elements produce appellant’s claimed results. Equivalency accordingly does not exist. The prior art teaches precisely opposite from what the final rejection presumes to be equivalent.

The In re Shaffer decision also has a direct bearing upon the obviousness conclusion by its holding:

“Although references may be combined to show that claim is unpatentable, they may not be combined indiscriminately; criterion to determine whether prior art suggests doing what applicant did; when references are combined to negate patentability, it should also be considered whether one skilled in art with references before him could have made combination of elements claimed without exercise of invention; it is not enough for valid rejection to view prior art in retrospect once applicant’s disclosure is known.”

The Examiner’s analysis of the prior art hinges upon the alleged fact that *Feldi* teaches that all hooked materials of VELCRO or any other brand are equivalent. Unfortunately, the correct factual analysis of those *Feldi* “VELCRO” or any other brand hook and loop fastening system teachings (as clearly understood by the ordinary artisan and plain language of *Feldi*) involves the paired and mating two-component fastening system, namely, a paired hook component and a paired loop component of the mating fastening system which are specially manufactured and adapted to engage and fasten onto one another. The hook alone is not the paired hook and loop “fastening system”, nor is the loop alone the paired “hook and loop fastening system”. This is a far cry from saying that all of the hooks of any hook and loop fastening system may be legally and factually deemed to be an obvious equivalent and an actual equivalent to one another. The patent law does not permit the hypothetical extension of teachings, much less actual and obvious equivalency, to embrace subject matter which is clearly not taught by a reference. When *Feldi* talks in terms of a “fastening system”, *Feldi* is not referring only to the hook, but rather only to the combination of a “hook and fastening system” which are specifically designed and used to fasten together. These *Feldi* teachings have no relevancy to a very unique one-of-a-kind nylon monofilament hooked material of Appellant’s claimed and unknown ball retrieving attachment. The mating hook and loop fastening system of *Feldi* is neither Appellant’s unknown claimed ball retrieving attachment, nor does it provide the unexpected and untaught efficacy upon tangential contact with a tennis ball so as to superbly and

uniquely engage and repetitively lift all brands of tennis balls thereby. Thus, it should be self evident that *Feldi* provides no factual basis, guidance or motivation whatsoever for the alleged equivalency between what is taught by *Feldi* and what has been solely and uniquely discovered by the Appellant. The law clearly establishes that knowledge known only to a patent applicant cannot be used or imputed under 35 USC 103(a) as knowledge known by the ordinary artisan. Equivalency cannot be based upon what is known only to a patent applicant.

The Patent Office Board of Appeals in the decision of *ex parte Tannaka et al* 174USPQ38 (1971) involved a final rejection lacking any disclosure or suggestion of a claimed modification which was properly reversed by the Board on the grounds that:

“There existed no “prima facie case of obviousness “since there is no suggestion in the prior art that such a result could be accomplished by so modifying prior art devices...”, “...none of the references alone or when taken in combination suggest the missing feature of appellant’s claimed invention.”

The same speculative assumption arises by the reliance upon the “Widely used garment fasteners” are hook and loop fasteners such as currently marketed under the trademark VELCRO by VELCRO U.S.A., Inc. and under the trademark SCOTCHMATE by 3M Company” of *Melbye, et al*. These *Melbye, et al* teachings bear no relevancy whatsoever to the claimed embodiments of the Appellant’s unique and unknown tennis ball retrieving attachment. As pointed out above, the paired hook and loop components of “garment fasteners” of *Melbye, et al* or the “fastening system” of *Feldi* when utilized together in the manner intended by the manufacture will then serve as “garment fasteners”. This does not in any form or manner mean, suggest, or teach that you can use a hook from any fastening system and apply it to any and every type of material known to mankind. Both of the randomly gleaned *Melbye et al* and the *Feldi* teachings relied upon by the Examiner pertain only to a fastener combination or “fastening system” which relies upon both the paired hooked and looped component as especially paired and designed by their respective manufactures to function (as sold and distributed) as a fastening system by cooperatively fastening onto one another. Such teachings do not in any form or manner direct or motivate the artisan towards the uniquely different claimed embodiments of Appellant’s heretofore unknown ball

attachment which has distinctively different characteristics from what is taught by the patents (singularly and collectively) and which has the solitary ability upon tangential contact to uniquely engage and lift all brands of tennis balls. Within this context, the Board's attention is directed towards *In Re Meinhardt and Shuman* 150USPQ54 (CCPA, 1966) which held:

"35 USC 103 requires the court to evaluate the claimed subject matter as a whole against teachings of the prior art references of record; references are evaluated by ascertaining facts disclosed therein as a whole; it is impermissible to first ascertain factually what Applicant did and then view prior art in such a manner as to select from random facts of that art only those which may be modified and then utilized to reconstruct Appellant's invention from such prior art."

This is precisely the approach taken in the reliance upon the hook and loop fastening system and hook and loop garment fastener of *Melbye, et al* and *Feldt* in the final rejection. There exists no art whatsoever which would remotely lead or suggest to the ordinary artisan those unknown embodiments of the very highly specific and unique tennis ball retrieving attachment of Appellant's claimed invention and its use or even more remotely any anticipation whatsoever that such clearly unexpected results would be achieved as claimed in Appellant's claims 1-15. The 35 USC 103(a) rejections of Appellant's claims 1-15 accordingly cannot be reconciled with *In Re Warner* 54CCPA/1628, 154USPQ173 (1967) which held:

"Rejection based on section 103 clearly must rest on a factual basis and these facts must be interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation all facts must be considered. The Patent Office has the initial duty of supplying the factual basis for its rejection. It may not because it may doubt the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis."

An analogous situation involving the leading away teachings of the cited patents of record herein may be found in the Tenth Circuit Court of Appeals decision of *Staley Manufacturing vs. Harvest Brand, Inc.* 171 USPQ/795 (1971), in which the Tenth Circuit held:

"That although all elements were old and known in the prior art, their combination was patentable since it overcame all the problems and went against the teachings of the prior art."

Another oft cited Court of Customs Patent Appeals decision of *In Re Wesslau* 147/USPQ/391 (1965) directly reflects upon the facts and legal considerations herein in which decision the CCPA concluded that:

“It is impermissible within the framework of section 103 to choose from any one reference only so much as it would support a given position to the exclusion of the other parts necessary to a full appreciation what that reference fairly suggest of ordinary skilled in the art.”

Appellant “may rely on the fact that the most specific teachings cited by the Examiner, uncontradicted by the art of record, lead away from what applicant claims”, (e.g. In re *Lundsford* 148 USPD 721 (CCPA 1966). A full appreciation of *Feldi* requires both the hook and loop fastening system as the only manner in which tangential engagement and lifting between the tennis ball and the attachment will occur. A full appreciation of *Urwin* teaches that you must use an attachment which graspingly surrounds the tennis ball since tangential contact will not work. *Melbye, et al* teaches mushroom type fasteners. *Musslin* teaches nothing about Appellant’s unknown claimed tennis ball retrieving attachment. The essence of those teachings cannot be disregarded in any rejection of Appellant’s claims 1-15 since they collectively teach the futility and unexpectedness of the claimed embodiments of Appellant’s claims 1-15.

The present final rejection relies extensively upon piece meal examination of the prior art solely in light of Appellant’s contribution and reconstruction of these pieces, totally in light of Appellant’s own invention, to fabricate an alleged *prima facie* case of obviousness. *Feldi* involves the use of a two component fastening system which includes both the hook component and the loop component. The *Feldi* ball cover is changed necessarily so that it either contains the paired hook component or the paired loop component and the mating opposite of the “hook and loop fastening system” for the tennis racquet so that there exists mutual cooperative engagement for the “ball gripper” concept. Both the “hook and loop” of the “fastening system” are required in order to fulfill the “ball gripper” concept or idea of *Feldi*. The same defect exists in the application of the garment fasteners identified as “hook and loop fasteners “ marketed under VELCRO and SCOTCHMATE trademarks and “mushroom-type fasteners” of *Melbye, et al*.

The decision of *In Re Pye and Peterson* 143 USPQ 426 provides guidance as to the issue of properly combining references under 35 USC 103 by holding that:

“While, as an abstract proposition, it might be possible to select certain statements from references and mechanically combine them with other references to arrive at Applicant’s claimed combination, there is no basis for making such a combination; neither reference is directed to the problem solved by Applicant’s invention. Only Applicant’s specification suggests any reason for combining teaching of prior art, but use of such suggestion is improper under 35 USC 103.”

Recognizing that there exists no disclosure of Appellant’s claimed tennis ball attachment, reference is also made to *Shaffer* USPQ326 (CCPA1956) which held that:

“Although references can be combined to show that a claim is unpatentable they may not be combined indiscriminately. Criterion to determine whether the combination is proper is whether the prior art suggest what the appellant did. None of the references suggest what the Appellant has done here.”

There is no suggestion in the cited prior art whatsoever to first discover and then utilize a totally undisclosed and untaught one-of-a-kind tennis ball retrieving attachment (unknown) in the manner as taught and claimed by the Appellant herein, and even more astoundingly, to accomplish what could not be accomplished. With a striking similarity to these facts, *In re Fristsch* USPQ1261 Federal Circuit 1992, held that:

“It is impermissible to use a claimed invention as an instruction manual or a template to piece together teachings of a prior art so that the claimed invention is rendered obvious and unpatentable.”

As to the applications of the *Urwin* patent, the *Melbye et al* patent, and the *Feldi* patent in the 35 USC 103(a) rejections of record, the Board’s attention is also courteously directed to the decision *Ex Parte McKay* 147USPQ220(1965) which the United States Patent Office Board of Appeals held:

“Claims are not rejected for obviousness merely because the various portions of applicant’s concepts are found amongst the references since the references do not suggest the applicant’s arrangement of elements, absent applicant’s disclosure; specific element of one reference has pertinency to element to the remaining references only after applicant’s disclosure, not that the prior art made the relationship obvious.”

There exists a long line of cases which hold that references or patents cannot be properly combined under 35 USC 103(a) if the omission of a required processing step or element from the cited patent clearly contravenes the patent teaching objective, or if the combined teachings renders the patented device or patented method useless or inoperative for its intended function and purpose, or if the combined teachings destroy the essence of the patent teachings relied upon, then there exists no basis under 35 USC 103(a) for combining the patent teachings (e.g. see *Ex Parte Hartmann* 188 USPQ 366, *Ex Parte Weber* 154 USPQ 491, *Ex Parte Sternau* 155 USPC 733, etc.). The proposed combination renders both *Feldi* and *Urwin* inoperable for their intended function and purpose. If a patent states an element is essential to the operation of a process or a function of a device, a combination of references relying in part upon such patent teachings cannot dismiss such essential teachings as immaterial and then propose (under the guise of the combined teaching) a device or method completely contradictory to what the patent teaches. These well established standards for combining references are well summarized in the *Ex Parte Sternau* holding which held that:

“References may not be combined since there is nothing in their disclosure that would teach the combination or reason for it; moreover, combination would destroy the apparatus of one reference for its invented purpose.”

You cannot apply either *Melbye*, *Feldi* or *Urwin* without destroying the essence of the teachings by removing essential operative elements with striking similarity to appellant’s rejected claims 1-15, the Board of Appeals *In Ex parte Shepard et al* 188 USPQ, the Board rejected the Examiner’s position by holding:

“... such modification by substitution is untenable absent some direction... Further more, the resulting structure would render material element of the Goetz et al system useless... In short, there is neither support in the prior art for the claimed limitations nor suggestion to combine references.

Any reference combination based upon *Feldi*, *Melbye et al* or *Urwin* is necessarily in non-compliance with the guidelines of 2143.02 M.P.E.P. by its requirement that:

“If proposed modification would render the prior art invention being modified unsatisfactory for its untended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).”

By the same token, there exists a non-compliance with the 2143.03 M.P.E.P. guidelines (e.g. see MPEP 2100-99, Feb. 2000) and directive:

“that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).”

How can *Feldi* be used alone or a primary reference (both rejections) or combined with *Urwin* without rendering both patents unfit for their intended purpose or inoperable.

The final rejection presupposes that amongst the vast number of paired hook and loop fastening systems, that the prior art would be drawn as a magnet towards the sole use of a hooked fastener component without its paired mating loop component for a use for which it was not designed and taught as ineffective (e.g. *Feldi* and *Urwin*) with an unanticipated discovery of an unknown tennis ball attachment unexpectedly possessing four to six fold efficacy in tenaciously engaging and lifting all tennis balls. An unknown feat which relies upon very specific and limited embodiments for its unexpected fulfillment.

The M.P.E.P. guidelines of Section 2143.02 requires that in order to modify or combine references for 35 USC 103(a) purposes, “there exists a need for a predictability of success and that evidence showing no reasonable expectation of success fully supports Appellant’s position that the claimed invention is unobvious, In re *Rinehart* 187 USPQ 143 (CCPA 1976)”. Under 35 USC 103, the rejections of appellant’s claims herein, both the “predictability of success” and appellant’s claims 1-15 have “achieved more than a combination which any or all of the prior art reference suggested, expressed or by reasonable expectation” In re *Sernakez* 702 F.2d 994 USPQ 1 (Fed. Cir. 1983).

There also exists a long line of cases which stand for the legal conclusion that even if the references were deemed to establish a prima facie case of obviousness, any such a prima facie case



is overcome if there is of record a showing unexpected results. This is succinctly pointed out in *Orfeo and Murphy* 9169 USPQ 487, which held that:

“even though the claimed invention involves the use of a known compound in a known process, it is still unobvious to one of ordinary skill in the art because of the new and unexplained results and effects achieved.”

With striking similarity to Appellant’s invention as it relates to *Musslin et al* and the other cited patents, it is also interesting to note that the Court of Customs and Patent Appeals In *Re Russell* 169USPQ426 (CCPA1971 ) held that:

“Even though a part of Applicant’s range of proportions and ingredients are suggested by broad teachings of reference, if applicant can establish his relevantly narrow range yield unexpected superiority results as against broad references ranges as a whole, applicants will have established unobviousness of their claimed invention.”

Appellant’s rule 132 Affidavit of Record, as well as the tabulated exemplary results of Appellant’s specifications clearly indicate that the uniquely different tennis ball retrieving attachment as claimed (claims 1-15) by the Appellant herein yields unexpected results. These unexpected results are further substantiated by a prior art which clearly teaches that Appellant’s claimed results cannot be achieved and cannot be accomplished in the manner as claimed and achieved by the Appellant herein. The prior art supports the unexpectedness of Appellant’s claims 1-15. If the results are more than would be expected, then the results would not be suggested by the art and therefore unobvious.

The Examiner’s reliance upon the hook and loop fasteners of Melbye, et al to extend to the unique, one-of-a-kind preshrunk monofilament hook of a highly specific and narrowly defined characteristics and to show that VELCRO and SCOTCHMATE are functionally equivalent as hook-and-loop fasteners misses the whole point of the claimed invention. What relevancy does a paired hook and loop fastener system have to Applicant’s claims? Applicant is not claiming a paired hook and loop fastener system combination of either VELCRO or SCOTCHMATE. It is meaningless within the context of either Appellant’s claims or the meaning to the ordinary artisan that VELCRO and SCOTCHMATE are known as paired hook and loop

fasteners or garment fasteners. The raw fact is that Appellant is not claiming a paired hook and loop fastener combination, but a unique and unknown tennis ball retrieving attachment 30. Yes, *Feldi* does disclose and use a paired hook and loop fastening system and uses this combination to allow either the paired hook or loop covered ball (not a tennis ball) to be picked up with the racquet having the other mating or paired hook or loop component for engaging onto the newly covered hook or loop covered ball. Both paired elements are required by *Feldi* (i.e. neither the hook nor loop alone) to allow for the engagement and lifting of a ball with the hook and loop combination. The hook will not work by itself, as clearly taught by *Feldi*. It is only when the paired hook and loop fasteners are used together will it work. *Feldi* clearly establishes that no equivalency may be established by the non-equivalency hook and loop fastener teachings of *Feldi* towards Appellant's monofilament hook which all by itself as opposed to all other non-working monofilaments imparts the unique ability to repeatedly tangentially engage and lift all major brands of tennis balls. *Feldi* clearly teaches the non-equivalency of all hook and loop fasteners from Appellant's claimed monofilament hook.

The obviousness conclusion that, "given *Melbye*'s teachings 1 Col, lines 15-18), the SCOTCHMATE is a known hook and loop fastening system, it would be obvious to substitute a SCOTCHMATE fastener for the VELCRO one", means precisely what is stated by *Feldi*, namely to use the paired hook and loop fastening system is its entirety, (i.e. both and no more) the paired hook and loop fastening system. The Examiner wishes without any concrete or factual evidence to speculatively extend these explicit teachings beyond their meaning to include an un contemplated use by an undisclosed and unknown tennis ball retrieving attachment possessing astounding efficacy.

The manner in which Appellant's own teachings have been used by the Examiner to establish an alleged *prima facie* case of obviousness has not been favorably received by this Board as well as by the Federal Circuit Court and its predecessor, the Court of Customs of Patent Appeals. There should be no doubt that Appellant throughout her specification has expressly stressed the uniqueness of her own ball retrieving attachment, how it is patentably distinguishable

from all other possibilities (e.g. see page 5, line 1 through page 6, line 4; page 9 line 1 through page 10, line 4; page 11, etc.) and how it yields unexpectedly superior ball retrieving results over all other hooked materials (e.g. see Tables 1-3 and the test results of one reported on pages 15 and 16.)

Pursuant to the Enabling and Best Mode Contemplated by the Inventor Provisions of 35 USC 112, the Appellant has made a full and complete disclosure of three different versions of SCOTCHMATE hook and loop brand (SJ 3526, SJ 3519, and SJ 3572 which primarily differ in their adhesive backing but fall within the very narrowly defined claimed hooked materials of which the SJ 3526 exhibited a most appropriate adhesive backing for securance to the shoulder of a tennis racquet. These teachings are Appellant's own teachings and do not in any form constitute prior art teachings or that all paired hook and loop fastener systems are equivalent to one another, or more remotely, that all SCOTCHMATE and all VELCRO brand products are equivalent to one another. The tabulated comparative results of Appellant's example, as well as her Rule 132 Affidavit of Record, clearly reveal that no such art recognized equivalency exists between a host of different types of hooked materials. How can equivalency exist when it is in the Office Action based totally upon what is only known to the appellant and appellant's claims are limited to the only those combined cooperative elements capable of performing the claimed embodiments of the invention? That should be enough in itself to rebut any *prima facie* case since in the absence of Appellant's own teachings there exists no plausible reason or motivation to direct the ordinary artisan towards the unique claimed embodiments (e.g. isolation of the hook from loop, use of it in conjunction with an alien substance such as a tennis ball, and discovery of unexpected efficacy) of Appellant's invention. What is disclosed and claimed by Appellant is unknown. These factors by themselves should be sufficient to rebut any *prima facie* case of obviousness and most certainly when viewed within the context of the Appellant's unexpected results in the light of prior art teachings disclosing the futility of Appellant's unexpected discoveries.

The factual background and legal conclusions of the present final rejection fall within the ambit of the In Re *Waymouth and Koury* 182 USPQ 290 (CPPA 1974) in which the *Waymouth*

*et al* applicants had discovered that a certain specific ratio of halogen atoms to mercury atoms broadly disclosed by the prior art, but not specifically disclosed in any of the patents relied upon in the final rejection were found by *Waymouth et al* to yield unexpectedly superior results. Similar to the facts herein, none of the patents disclosed the critical aspects of the claimed *Waymouth et al* invention, and in fact led the art away from the invention as do the combination patents as cited by the Examiner herein. With particular relevancy herein, *In re Waymouth* and *Koury* held that:

“The Court must not read obviousness into an invention on the basis of appellant’s own statements.”

In chastising the Examiner and Board for considering appellant’s own findings as part of the prior art, coupled with prior art teachings leading away from appellant’s claimed invention, *In re Waymouth* observed that:

“Although Reiling’s range of possible ratios envelops the range claimed by appellants, we believe that the appellants’ graph in Figure 2 demonstrates the necessary unexpected results. Those results follow from the selection of Appellants’ critical range, which is narrower than the extremely broad inherently disclosed range of Reiling.”

The *Waymouth et al* decision illustrates a proper analysis of the claimed invention as a whole, including all of the claimed elements of the invention and the unexpected results of the invention, and a comparison of all of the claimed limitations of the claimed invention with the prior art teachings as a whole, and a weighing of all the evidence of record as a necessary prerequisite to a determination of any *prima facie* case of obviousness. The evidence and legal precedence sustaining the patentability of Appellant’s claims herein is clear by reason of a lack of those facts essential to justify any *prima facie* case of obviousness and the reliance upon a generalization that terms (paired garment fasteners and paired hook and loop fastener systems establish an equivalency for all hooked components) *In re Freid*, 165 USPQ 570(CCPA, 1970) correctly observed that:

“Any determination of obviousness must be based on facts and not on unsupported generalities.”

Any unsupported generalization such as the equating of all paired garment fasteners, paired hook and loop fastening systems, and mushroom type fasteners together with any and each unpaired hook component by itself falls directly within this purview. It is also pointed out by *Melbye, et al* the hook and loop fastener systems are predicated upon chemically processed polymeric materials which by the very nature of their processing and chemical nature can lead to a vast array of different products possessing completely different properties and uses. As consistently held, chemical compositions are inherently unpredictable and inherency cannot be proven by the application of generalities such as the equivalency of all fastening hook and loop fastening systems as in the final rejection of record.

Within the same context of these decisions and their application to the controlling facts herein, attention is further directed to *In re Westlau*, 147USPQ391, (CCPA,1965), which held that:

“...since no one of the references suggests such a substitution, quite apart from the result which would be obtained thereby; such piecemeal reconstruction of prior art patents in light of applicant’s disclosure is contrary to 35 USC 103.” “... It is impermissible within framework of Section 103 to choose from any one reference only so much of it as will support a given position, to exclusion of other parts necessary to full appreciation of what reference fairly suggests to one of ordinary skill in the art.”

No reference herein suggests Appellant’s claimed tennis ball retrieving attachment or its use; and no reference phantoms Appellant’s claimed unexpected result.

In the decision of *In re Pye and Peterson* 148 USPQ426(CCPA,1966), the Court of Customs and Patent Appeals was confronted with a similar problem of ascertaining whether or not a combination of references were sufficient to justify a *prima facie* case of obviousness. Similar to *Musslin*, one of the references relied upon in the *Pye et al* rejection was noted by the C.C.P.A. as being “extremely vague as to the exact structure of the polymers useful in their invention.” The Court concluded that:

“...it would be impossible to determine whether the polymers disclosed by *Fikentscher* are the same as those recited in the appeal claims. Moreover, that *Fikentscher* is completely silent as to the molecular weight of the polymers.”

In reversing the Board of Appeals, C.C.P.A. held that:

“While it might be possible to select certain statements from reference and mechanically combine them with other reference to arrive at applicants’ claimed combination, there is no basis for making such a combination; neither reference is directed to problem solved by applicant’s invention; only applicants’ specification suggests any reason for combining teachings of prior art, but use of such suggestion is improper under 35 USC 103.”

The final rejection alludes speculatively to the combined teachings as inherently embodying Appellant’s claimed invention. However, inherency cannot be presumed, as the decision of *ex parte Cyba* 155 USPQ 756 clearly held that:

“a rejection based upon inherency may not be sustained unless inherency is certain.”

There exists no plausible ground for assuming all paired hook and loop fastening systems are equivalent, let alone all hooked components. The failure to establish a *prima facie* case of obviousness by randomly selected passages falls within the same pitfalls observed in *Ex Parte Fleischmann* 157 USPQ 155 where the Board of Appeals correctly stated that:

“While it might be possible to select features from secondary references and mechanically combine them with primary reference to arrive at applicant’s claimed combination, there is no basis for making such combination disclosed or suggested in references; only applicant’s specification suggests any reasons for combining references; under 35 USC 103, that does not constitute a bar.”

The patent teachings relied upon by the Examiner herein discourages research in the field where Appellant made her invention. Appellant has invented a method for producing and using a novel tennis ball retrieving attachment (unknown) attached to a shoulder of a tennis racquet in the face of prior art, strongly suggesting that such a product and method will produce unacceptable results. This is the antithesis of obviousness. In *re Rosenberger et al*, such conclusions was reached in which held:

“Teachings of reference discourages research in field where applicants made their invention; thus, applicants invented a method for producing effective product in face of art strongly suggesting that such method would produce unacceptable results; this is antithesis of obviousness.”

The M.P.E.P. 2144.05 III (2100-107) guidelines concur.

The astute decision of Judge Rich in the decision of *In re Civitello* 140 USP 10 (CCPA1964) appears also to be most applicable to an understanding of an insufficiency of the reference combination in establishing a *prima facie* case of obviousness herein. Similar to the *Civitello* facts, there existed no facts whatsoever in suggesting that the references used in the obviousness combination rejection disclosed a claimed element of appellant's invention. Judge Rich correctly noted that:

"Since first reference fails to disclose feature of claim relied on, it would not suggest modifying second reference to contain that feature; Patent Office finds suggestion only after making a modification which is not suggested by anything other than applicant's disclosure; this is hindsight reconstruction and does not establish obviousness."

Similarly, the reliance upon Appellant's disclosure to establish equivalency is flawed for several paramount reasons which have long been recognized by courts. Clearly, the equivalency argument rests upon matters only known to Appellant. However, as mentioned before, the equivalency argument is flawed by reasons that:

1. Appellant has clearly disclosed throughout her specification that:
  - a. Other materials do not work; and
  - b. The uniqueness and solidarity of her claimed ball retrieving attachment.
2. The prior art, as relied upon by the Examiner, teaches the inoperability and unfitness of hooked materials when used as tangential contacting and tennis ball lifting attachments.
3. What was alleged to be equivalent is, in fact, not equivalent; and
4. To rely on equivalency known only to Appellant to establish obviousness is to assume that her disclosure is part of the prior art, which is contrary to 35 USC 103(a).


It should be again noted that there is no reason whatsoever made of record that the very unique, distinctive and unknown ball retrieving attachment of the claims 1-15 should be attached to tennis racquet and used as prescribed by Appellant's method claims 10-15.

Appellant respectfully submits that the 35 USC 103(a) rejections of claims 1-15 fails to establish a *prima facie* case of obviousness. The obviousness hinges upon untaught matters only known to Appellant. The 35 USC 103(a) rejections of record rely upon teachings only known to Appellant as a basis for combining isolated and discordant teachings from the cited patents to create a combination which contradicts those very patent teachings relied upon in making the combination and renders most of the patents unfit or inoperative for their intended purpose.<sup>1</sup> In making the combined patent teachings, it is necessary to modify the patent teachings of record to exclude elements which are taught as being essential so as to create modified patent teachings irreconcilable with what the patentees teach as essential to their respective operability.<sup>1</sup> Lastly, there exists no expectation from the prior art of a unique tennis ball retrieving attachment which not only could upon tangential contact repetitively lift not only all major tennis ball brands (when all others fail), but also engage a weighted tennis ball of a weight of more than four times and up to six times the tennis ball weight.<sup>7</sup> These are truly unexpected results achieved in face of art teaching that tangential lifting is not feasible. These results refute any possible *prima facie* case of obviousness.

In view of the aforementioned, the appellant respectfully requests the Board of Appeals to reverse the rejection of claims 1-15 of record.

Dated this 10<sup>th</sup> day of October, 2002.

Respectfully submitted,

  
M. Paul Hendrickson

M. Paul Hendrickson  
Attorney for appellant  
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Fax: 608-526-2711



**APPENDIX**

**EXHIBIT A**

**PAGE A1-A3**



**APPEALED CLAIMS**

1. A combination of a tennis racquet equipped with a ball retrieving attachment attached to a shoulder of the racquet in a ball retrieving position for engaging and lifting a grounded tennis ball upon tangential contact with said tennis ball, said attachment comprising a hooked fastener material adhesively attached to a convex outer perimeter portion of the shoulder so as to permit the hooked fastener material to make the tangential contact with said grounded tennis ball, with said hooked fastener material having a series of pre-shrunken nylon monofilament hooks for engaging and lifting the grounded tennis ball upon the tangential contact, with said hooks being characterized as having an average monofilament diameter greater than 8.0 mil and an average hook height of at least 1.70 mm.
2. The combination according to claim 1 wherein the hooks are further characterized as having an average hook width of at least 1.0 mm.
3. The combination according to claim 2 wherein the hooks are further characterized as having an average hook depth of greater than 0.5 mm.
4. The combination according to claim 1 wherein the average height of the hooks is at least 1.85 mm, the average diameter is at least 8.25 mil and the attachment is further characterized as having an average hook width of at least 1.0 mm and an average hook depth of at least 0.60 mm.
5. The combination according to claim 4 wherein the attachment contains at least 250 hooks per square inch with the series being an arrangement of repetitive rows of the hooks.

6. The combination according to claim 5 wherein the attachment comprises the hooks mounted to a rubber backing with a pressure sensitive adhesive for detachably mounting the attachment to the shoulder of the racquet.

7. The combination according to claim 5 wherein the attachment is applied as a continuous strip to the shoulder of the racquet at a tennis ball retrieving position.

8. The combination according to claim 7 wherein the attachment is positioned along an outer peripheral edge of the shoulder between an eight o'clock and four o'clock position.

9. The combination according to claim 6 wherein the attachment contains at least 300 hooks per square inch, the average height of the hooks is greater than about 1.90 mm, the average hook width ranges from about 1.1 mm to about 1.3 mm and the average hook depth ranges from about 0.65 mm to about 0.75 mm.

10. A method for retrieving a grounded tennis ball with a tennis racquet equipped with a ball retrieving attachment attached along an outer peripheral edge of a shoulder of the tennis racquet with the hooked material positioned thereupon at a retrieving position for engaging and lifting a grounded tennis ball upon tangential contact therewith, said method comprising:

a) providing a strip of a hooked material having a pressure sensitive adhesive applied to a resilient backing member equipped with a plurality of pre-shrunk nylon monofilament hooks of an average monofilament diameter of at least 8.0 mil, an average hook height of at least 1.85 mm, an average hook width of at least 1.0 mm, and an average depth of at least 0.6mm, with the hooks being of a spiral configuration arranged in repetitive rows of at least 250 hooks per square inch;

b) applying the pressure sensitive strip to the outer peripheral edge of the shoulder of the tennis racquet at the retrieving position so as to permit the nylon monofilament hooks of the hooked material to make the tangential contact with the grounded tennis ball;

c) tangentially contacting the grounded tennis ball with the nylon monofilament hooks of said hooked material so as to engage and hook a tennis ball nap of the grounded tennis ball onto said nylon monofilament hooks;

d) lifting the hooked tennis ball engaged by the nylon monofilament hooks with the tennis racquet; and

e) retrieving the lifted tennis ball from the strip.

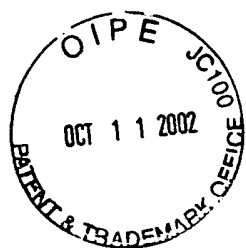
11. The method according to claim 10 wherein the method includes the applying of the strip at a contacting position between a nine o'clock to a three o'clock position of the shoulder.

12. The method according to claim 10 wherein the average monofilament diameter is at least 8.25 mil, the average height is at least 1.90 mm, the average hook is at least 1.05 mm, and the average hook depth is at least 0.65 mm.

13. The method according to claim 12 wherein the applying includes the applying of at least one strip positioned along the peripheral edge located from a nine o'clock position to about a three o'clock position.

14. The method according to claim 13 wherein the strip covers the nine o'clock position and the three o'clock position.

15. The method according to claim 13 wherein a continuous strip is applied to the shoulder.



## APPENDIX

### EXHIBIT B

Pages B1-B10

Exemplary listing of hook and loop product and processing patents.

Patents - Few of many hundreds

#### U.S. Patent No.

2,717,437	3,009,235	3,241,881
3,313,511	3,027,566	3,338,291
2,933,797	2,976,914	3,328,081
3,485,529	3,279,008	3,147,527
3,154,837	3,196,490	3,136,026
3,546,754	3,550,223	3,550,837
3,562,044	3,562,770	3,577,607
3,586,060	3,594,863	3,594,865
3,595,059	3,629,032	3,665,584
3,673,301	3,695,976	3,708,382
3,715,415	3,732,604	3,735,468
3,781,398	3,801,245	3,943,981
4,024,003	3,405,430	3,527,001
3,913,183	4,041,549	4,169,303
4,290,174	4,615,084	4,617,214
3,594,873	5,349,991	5,515,583
6,202,264	3,031,730	3,138,841
3,147,528	3,138,841	3,147,528
3,192,589	3,261,069	3,607,995
3,718,725	3,770,359	3,785,012
3,808,301	3,808,648	3,900,652
4,454,183	4,628,709	

and many, many more.

U.S. Patent No. 4,910,062 - Exemplary teachings.

First Sentence "Background Art": The art is replete with sheet materials that can be cut into smaller pieces to form portions of fasteners, and methods for making such sheet materials. U.S. Pat. Nos. 2,933,797; 3,009,235; 3,136,026; 3,154,837; 3,577,067; 3,673,301; 3,943,981; and 4,024,003 provide illustrative examples.

## USPTO PATENT FULL-TEXT AND IMAGE DATABASE

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Searching All Years...

Results of Search in All Years db for:  
hook AND "loop fastener": 5215 patents.  
Hits 1 through 50 out of 5215























Exemplary of  
remaining 5215 Hits

Next 50 Hits

Jump To

Refine Search

PAT. NO.	Title
1 6,453,525	<a href="#">Double-bow shoe lace device</a>
2 6,453,493	<a href="#">Covers for support pillows</a>
3 6,453,475	<a href="#">Convertible visor/cap with a plurality of crown supports</a>
4 6,453,204	<a href="#">Magnetic electrode for delivering energy to the body</a>
5 6,451,405	<a href="#">Oil tarp assembly for heavy machinery</a>
6 6,451,239	<a href="#">Process of making a hook fastener using radio frequency heating</a>
7 6,450,944	<a href="#">Acceleration protective suit</a>
8 6,450,895	<a href="#">Golf practice device with adjustable golf ball tee platform and adjustable leg stance platform</a>
9 6,450,168	<a href="#">Infant sleeping blanket/garment for use with medical devices</a>
10 6,450,131	<a href="#">Forward bending motion control harness</a>
11 6,449,881	<a href="#">Detachable shoe wallet</a>
12 6,449,777	<a href="#">Child-proof eyewear retainer strap assembly</a>
13 6,449,770	<a href="#">Restraining garment device</a>
14 6,448,742	<a href="#">Low profile battery pack with aircraft power provisions</a>
15 6,447,362	<a href="#">Rotating musical remote control mobile device with detachable toys</a>
16 6,447,353	<a href="#">Toddler/adult float jacket</a>
17 6,447,165	<a href="#">Shipping container that can be stiffened</a>
18 6,446,994	<a href="#">Bicycle fender system</a>
19 6,446,852	<a href="#">Belt assembly for storage and inventory of tools</a>
20 6,446,831	<a href="#">System for dispensing aprons</a>
21 6,446,751	<a href="#">Apparatus and method for reducing noise levels</a>
22 6,446,688	<a href="#">Carry bag with pouch insert and cover</a>
23 6,446,577	<a href="#">Insulated cover for portable kennel</a>
24 6,446,361	<a href="#">Transformable slipper toy</a>
25 6,446,269	<a href="#">Concealed lower body garment support belt</a>
26 6,443,986	<a href="#">Self-forming prosthetic device and method of making the same</a>
27 6,443,805	<a href="#">Bra shelf and application thereof</a>
28 6,443,787	<a href="#">Flying ski</a>

- 29 [6,443,655](#)  [Flood barrier](#)
- 30 [6,443,617](#)  [Resealable sack or bag](#)
- 31 [6,443,525](#)  [Vehicle seat assembly and fastening device](#)
- 32 [6,443,499](#)  [Apparatus for pre-conditioned air hoses and a method of assembling pre-conditioned air](#)
- 33 [6,443,415](#)  [Computer monitor organizer assembly](#)
- 34 [6,443,407](#)  [Accessory tray for a tripod](#)
- 35 [6,443,335](#)  [Rapid comestible fluid dispensing apparatus and method employing a diffuser](#)
- 36 [6,443,297](#)  [Pulley lagging with hook and loop fastener attachment system](#)
- 37 [6,443,187](#)  [Aligning woven loop elements to form mounting sleeves](#)
- 38 [6,443,101](#)  [Pet apparel with leash](#)
- 39 [6,442,889](#)  [Insect and animal traps and holder for same](#)
- 40 [6,440,526](#)  [Non-slip pad](#)
- 41 [6,439,958](#)  [Breast saver comfort](#)
- 42 [6,439,733](#)  [Removable helmet light system](#)
- 43 [6,439,637](#)  [Golf cart cover](#)
- 44 [6,439,537](#)  [Forming mold with recess having snap-fit end seal](#)
- 45 [6,439,432](#)  [Personal safety device](#)
- 46 [6,439,314](#)  [Aqua boot for horses](#)
- 47 [6,439,221](#)  [Method and apparatus for providing a portable preassembled grill](#)
- 48 [6,439,167](#)  [Pet collar for use with pet containment system](#)
- 49 [6,439,152](#)  [Device for marking the path along the ground of a rolling wheel](#)
- 50 [6,438,900](#)  [Storage chamber](#)
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( 4993 of 5215 )

United States Patent  
Yoshida

4,646,397  
March 3, 1987

Surface-type fastener

**Abstract**

A surface-type fastener comprising a pair of fabric fastener strips, one fastener strip having on its one surface a number of *hook*-shaped engaging elements engageable with a number of loop-shaped engaging elements on one surface of the other fastener strip. One surface of each fastener strip has a first region in which the engaging elements are disposed, and a second region devoid of engaging elements. The other surface of the individual fastener strip has, in registry with the first region, an area covered with synthetic resin.

Inventors: **Yoshida; Hiroshi** (Kurobe, JP)  
Assignee: **Yoshida Kogyo K. K.** (Tokyo, JP)  
Appl. No.: **744255**  
Filed: **June 13, 1985**

**Foreign Application Priority Data**

Jun 18, 1984[JP]

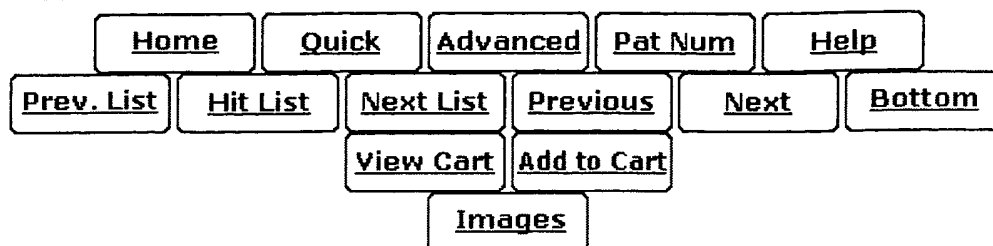
59-90592[U]

**Current U.S. Class:****24/442; 24/443; 24/448****Intern'l Class:****A44B 013/00****Field of Search:****24/442,443,444,445,446,447,448,451,452,426 2/DIG. 6 112/265.1,406****References Cited [Referenced By]****U.S. Patent Documents**

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<a href="#">3383738</a>	May., 1968	Fox et al.	2/DIG.
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**USPTO PATENT FULL-TEXT AND IMAGE DATABASE**

( 5019 of 5215 )

United States Patent  
Erb

4,615,084  
October 7, 1986

Multiple *hook* fastener media and method and system for making

**Abstract**

Multiple *hook*-fastener media in which many protruding hooks are formed at relatively high speed from suitable bendable and settable plastic material which may be different from the substrate to which these pre-formed hooks are subsequently bonded. Many rows of hooks are formed simultaneously, each row from a strand, for example, a monofilament of longitudinally oriented polymeric material. The formed strands are "set" into their multiple *hook* row configuration, and then these pre-formed rows of hooks are simultaneously bonded to the substrate. Thus, an attractive substrate of any reasonable width, for example, of three inches, six inches, a foot or a yard, may be used. The production method and system enable the number of hooks per square inch, either longitudinally or laterally or both, to be adjusted while running. The shank of each *hook* includes two legs, and the production method and machine can be adjusted while running for making hooks with crossed legs, uncrossed legs or divergent legs for achieving varieties of configurations and characteristics, as desired for various applications. Advantageously, the production can be changed for making taller or shorter hooks and for making hooks with differently shaped arcuate ends by exchanging one pair of meshing (interdigitating) shaping belts for another. The substrate material may be woven or unwoven and may comprise multiple layers including metal or plastic layers or both. The substrate with mounted hooks can be slit longitudinally for producing many *hook*-fastener tapes at relatively fast overall lineal speed. Consequently, the *hook*-fastener media of this invention with their various sizes, shapes, widths and characteristics, fabricated by relatively low-cost, high-speed production hold promise of becoming widely available, widely used, commodity-type products which will find their way into myriads of applications of benefit to human beings in years to come.

Inventors: **Erb; George H.** (Cuttingsville, VT)  
Assignee: **Erblok Associates** (Charlottesville, VA)  
Appl. No.: **643001**  
Filed: **August 21, 1984**

Current U.S. Class: **24/442; 24/306; 156/66; 264/296; 428/93; 428/100; 428/369**  
Intern'l Class: **A44B 018/00**  
Field of Search: **24/306,442,445 156/66 264/235,296 428/93,100,369**

**References Cited [Referenced By]**

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<u>3546754</u>	Dec., 1970	Erb.	
<u>3550223</u>	Dec., 1970	Erb.	
<u>3550837</u>	Dec., 1970	Erb	229/45.
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<u>3562770</u>	Feb., 1971	Erb.	
<u>3586060</u>	Jun., 1971	Erb	139/46.



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United States Patent  
Higashinaka

4,920,617  
May 1, 1990

Separable fastener

**Abstract**

Described herein is a male fastener strip having a multitude of hooking elements on one side of substrate cloth, which is characterized in that the individual hooking elements are spaced from adjacent hooking elements by X(mm) and Y(mm) in the transverse and longitudinal directions of the fastener strip, respectively, such that X is between 2.0 and 4.0 mm, inclusive and X/Y is in the range of 0.5 to 3.5.

Inventors: **Higashinaka; Yukitoshi** (Iruma, JP)  
 Assignee: **Kuraray Company, Ltd.** (Kurashiki, JP)  
 Appl. No.: **266329**  
 Filed: **November 1, 1988**

**Foreign Application Priority Data**

Jul 30, 1986[JP]

61-181154

**Current U.S. Class:**

24/442; 24/446; 24/450

**Intern'l Class:**

A44B 018/00

**Field of Search:**

24/442,446,452,449,445,443,444

**References Cited [Referenced By]****U.S. Patent Documents**

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<u>3527001</u>	Sep., 1970	Kleemeier et al.	24/446.
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<u>4169303</u>	Oct., 1979	Lemelson	24/446.
<u>4290174</u>	Sep., 1981	Kalleberg	24/444.
<u>4615084</u>	Oct., 1986	Erb	24/442.
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<u>0037952</u>	Oct., 1981	EP.	
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<u>344410</u>	Oct., 1983	DE.	
<u>1380822</u>	May., 1968	FR.	

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United States Patent  
Higashinaka , et al.

6,386,242  
May 14, 2002

**Hook** fastener member to minimize damage to loops

**Abstract**

A flexible **hook** fastener member having a **hook** density of 80 to 200 per cm.sup.2 and causing little damage to cooperating loop fastening elements. The loops for forming **hook** fastening elements are produced by thin monofilaments having a fineness of 100 to 200 deniers. The monofilament for forming the **hook** fastening elements are in reverse phase relation to the adjacent ground warps with respect to the ground wefts.

Inventors: **Higashinaka; Yukitoshi** (Fukui-ken, JP); **Itoh; Hiroshi** (Osaka-fu, JP)  
 Assignee: **Kuraray Co., Ltd.** (Kurashiki, JP)  
 Appl. No.: **618844**  
 Filed: **July 18, 2000**

**Foreign Application Priority Data**

Jul 30, 1999[JP]

11-216238

**Current U.S. Class:**

139/391; 24/445

**Intern'l Class:**

A44B 018/00

**Field of Search:**

24/445 139/384 B,391

**References Cited [Referenced By]****U.S. Patent Documents**

<a href="#">3594873</a>	Jul., 1971	Hockmeyer, Jr.	139/391.
<a href="#">5349991</a>	Sep., 1994	Okawa et al.	139/391.
<a href="#">5515583</a>	May., 1996	Higashinaka	24/446.
<a href="#">6202264</a>	Mar., 2001	Ishihara	24/445.

**Foreign Patent Documents**

6-52521	Jul., 1994	JP.
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**Primary Examiner:** Falik; Andy**Attorney, Agent or Firm:** Oblon, Spivak, McClelland, Maier & Neustadt, P.C.**Claims**

What is claimed is:

1. A **hook** fastener member with damage to the to cooperating loop fastening elements minimized, comprising:

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( 1581 of 5215 )

United States Patent  
Provost, et al.

5,953,797  
September 21, 1999

**Hook** fasteners and methods of manufacture**Abstract**

A **hook** fastener member having rows of molded **hook**-shaped fastener elements that lie in planes aligned with the rows, with generally planar plate portions at the outermost ends of at least some of the fastener elements, the plate portions lying generally parallel to the base of the fastener member. The plate portions can enhance engagement of the **hook** fastener members with mating **loop fastener** members, particularly with low loft non-woven **loop fastener** members. A method of making fastener members is provided. Molten resin is extruded and applied to a molding roller, creating preforms. The outermost portions of at least some of the preforms are flattened, thereby forming generally plate shaped portions. Disposable absorbent garments advantageously incorporate the **hook** fastener members.

Inventors: **Provost; George A.** (Litchfield, NH); **Condon; Mark J.** (Melrose, MA); **Leak; A. Todd** (Neenah, WI); **Roslansky; Apiromraj S.** (Little Chute, WI); **Serbiak; Paul J.** (Appleton, WI)  
 Assignee: **Velcro Industries B.V.** (Curacao, NL)  
 Appl. No.: **731061**  
 Filed: **October 9, 1996**

Current U.S. Class: 24/452; 24/304; 24/442; 24/446  
 Intern'l Class: A44B 018/00  
 Field of Search: 24/452,442,445,446,448,304

**References Cited [Referenced By]**

U.S. Patent Documents			
<a href="#">3031730</a>	May., 1962	Morin	24/452.
<a href="#">3138841</a>	Jun., 1964	Naimer	24/204.
<a href="#">3147528</a>	Sep., 1964	Erb	24/204.
<a href="#">3192589</a>	Jul., 1965	Pearson	24/204.
<a href="#">3261069</a>	Jul., 1966	Mathison	24/204.
<a href="#">3607995</a>	Sep., 1971	Chiba	264/15.
<a href="#">3718725</a>	Feb., 1973	Hamano	264/163.
<a href="#">3770359</a>	Nov., 1973	Hamano	425/305.
<a href="#">3785012</a>	Jan., 1974	Billarant	24/204.
<a href="#">3808301</a>	Apr., 1974	Pruden	24/80.
<a href="#">3808648</a>	May., 1974	Billarant et al.	
<a href="#">3900652</a>	Aug., 1975	Uraya et al.	428/92.
<a href="#">4169303</a>	Oct., 1979	Lemelson	24/452.
<a href="#">4290174</a>	Sep., 1981	Kalleberg	24/204.
<a href="#">4454183</a>	Jun., 1984	Wollman	428/92.
<a href="#">4628709</a>	Dec., 1986	Aeschbach et al.	

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( 206 of 5215 )

United States Patent  
Akeno , et al.

**D457,053**  
**May 14, 2002**

*Hook element piece for hook-and-loop fastener***Claims**The ornamental design for a *hook* element piece for *hook-and-loop fastener*, as shown and described.

Inventors: **Akeno; Mitsuru** (Kurobe, JP); **Minato; Tsuyoshi** (Toyama-ken, JP)  
 Assignee: **YKK Corporation** (Tokyo, JP)  
 Appl. No.: **101309**  
 Filed: **February 26, 1999**

**Foreign Application Priority Data**

Sep 02, 1998[JP]

10-25157

**Current U.S. Class:****D8/382****Intern'l Class:**

0805/

**Field of Search:**

D8/382 24/452,442,448,444,453

**References Cited [Referenced By]**

U.S. Patent Documents			
<a href="#">5067210</a>	Nov., 1991	Kayaki	24/442.
<a href="#">D367419</a>	Feb., 1996	Murasaki	D8/382.
<a href="#">D374813</a>	Oct., 1996	Akeno	D8/382.
<a href="#">D376533</a>	Dec., 1996	Akeno	D8/382.

Primary Examiner: Baynham; Holly  
 Attorney, Agent or Firm: Hill & Simpson

**Description**FIG. 1 is a front view of a *hook* element piece for a *hook-and-loop* fastener.FIG. 2 is a top plan view of the *hook* element piece of FIG. 1.FIG. 3 is a right side view of the *hook* element piece of FIG. 1.FIG. 4 is a base view of the *hook* element piece of FIG. 1.

FIG. 5 is a cross-sectional view taken on line 5--5 of FIG. 2; and,

FIG. 6 is a fragmentary perspective view of the *hook* element piece of FIG. 1.

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( 4986 of 5215 )

United States Patent  
Provost, et al.

4,654,246  
March 31, 1987

Self-engaging separable fastener

**Abstract**

A self-engaging separable fastener is disclosed which comprises a base member of woven separable fastener material having at least two adjacent mating fastener sections. At least one section is defined by a plurality of loops upstanding from the base member, and the other section is defined by a plurality of hooks upstanding from the base member. The loops are formed of respective generally parallel rows of multifilament yarns interwoven into their respective base section so as to repeat the same loop direction and construction every predetermined number of picks and the hooks are cut from respective generally parallel rows of loops of monofilament yarns interwoven into their respective base section so as to repeat their loop direction and construction every predetermined number of picks, which latter number of picks is greater than the number of picks in which the direction of the multifilament loops is repeated. The density of the monofilament hooks is less than the density of the multifilament loops such that the sections of fastener material may be placed in face-to-face engagement by folding one section over the other and pressing the surfaces together and separated by peeling forces normal to the interfacial plane of engagement. Preferably the loops repeat themselves every four picks and the hooks repeat themselves every eight picks.

Inventors: **Provost; George** (Manchester, NH); **Ouellette; Marcel C.** (Bedford, NH)  
 Assignee: **Actief, N.V.** (Curaco, AN)  
 Appl. No.: **772591**  
 Filed: **September 5, 1985**

**Current U.S. Class:** 428/88; 26/2R; 26/8C; 26/8R; 26/29R; 428/100  
**Intern'l Class:** B32B 003/06  
**Field of Search:** 428/88,92,100 139/2 28/214 26/2 R,8 R,8 C,29 R 156/72

**References Cited [Referenced By]**

U.S. Patent Documents			
<a href="#">4058853</a>	Nov., 1977	Boxer et al.	428/100.
<a href="#">4165555</a>	Aug., 1979	Boxer et al.	428/100.

Primary Examiner: McCamish; Marion C.  
 Attorney, Agent or Firm: Pennie & Edmonds

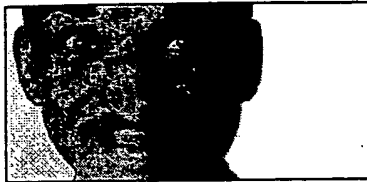
**Claims**

We claim:

1. A self-engaging separable fastener which comprises a base member of woven separable fastener material having at least two adjacent mating fastener sections, at least one section defined by a plurality of loop-like engaging elements upstanding from said base member, the other section defined by a plurality of *hook*-type engaging elements upstanding from said base member, said loop-like engaging elements being formed of respective generally parallel rows of loops of multifilament yarns interwoven into their respective base section so as to

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- [Hook & Loop Fasteners \(37 Companies\)](#)
- [Fasteners: Hook & Loop, Conductive \(3 Companies\)](#)

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Company Name	Location	Description
<a href="#">Velcro USA Inc.</a>	Manchester , NH	Hook & Loop Fastening Systems For Industrial Applications Where Separation & Rejoining Of Components Is Necessary, Or Where...
<a href="#">Middleburg Thread &amp; Sewing Supply</a>	Warminster , PA	Hook & Loop Fasteners, Sewing Quality, Pressure Sensitive, Heat Activated, Solvent Activated, Polyester, Display Pile....
<a href="#">Fasnap Corp.</a>	Elkhart , IN	Wholesale Distributor Of Snap Fasteners, Turn & Directional Fasteners, Grommets, Panel Fasteners, Metal & Plastic Hardware,...
<a href="#">Toleeto Fasteners International</a>	San Ysidro , CA	Reusable Hook & Loop Cable Ties, Wrist Bands & Custom Fabricated Straps For A Variety Of Applications. Ultrasonic Welding &...
<a href="#">Loktite, Inc.</a>	Timonium , MD	Dist. 3M & Other Hook & Loop Fasteners. Plain Backed, Pressure Sensitive, Dual Lock & Solvent / Heat Activated. Tapes,...
<a href="#">National Webbing Products Co.</a>	Garden City Park , NY	Complete Line Of Hook & Loop In All Widths & Colors. On Spools Or Cut Pieces, Hook & Loop Straps
<a href="#">Levitt Industrial Textile Co.</a>	Hicksville , NY	Dist. Of Velcro® Brand Hook & Loop Tape, Coins & VELCLOTH™ Brand Display Fabric. Special Colors, Widths, Lengths, Cut...
<a href="#">Gleicher Manufacturing Corp., A 3M Distributor</a>	Scotch Plains , NJ	Rotary & Flatbed Die Cutting, Laser Cutting, Clean Room Processing, Tapes, VHB®, Dual Lock®, Bumpons®, A 3M Dist.
<a href="#">Bond Products Inc.</a>	Philadelphia , PA	Suppliers Of Narrow Fabrics, Including Woven Tapes, Hook & Loop Tape & Dots, Drawcord Braids, Webbing, Elastics, Tying...
<a href="#">Bardsco</a>	St. Louis , MO	Reusable Hook & Loop Cable Ties, Wrist Bands & Custom Fabricated Straps For A Wide Variety Of Applications. Ultrasonic...
<a href="#">Touchtape, Inc.</a>	St. Augustine , FL	Standard & PS Hook & Loop Tape & PS Dots Available. In-House Mfg. & Fabrication. Custom Orders
<a href="#">Perfectex Plus LLC</a>	Huntington Beach , CA	Hook & Loop Fasteners. Sew-On Pressure-Sensitive Tapes. Heat & Solvent Activated Tapes. Fire-Retardant. Mil. Spec. Custom...
<a href="#">Action Fabricators</a>	Grand Rapids , MI	Pressure Sensitive Adhesives, Tapes, Rubber Bumpers, Felt Feet & Pads. Die Cutting Of Various Materials. Specialize In...
<a href="#">Speedtech International, Inc.</a>	Chicago , IL	Mfr. & Dist. Of Hook & Loop Fasteners. Stocking VELCRO®, SPEEDWRAP® & Other Brands
<a href="#">WBC Industries, Inc.</a>	Westfield , NJ	Hook & Loop Fasteners
<a href="#">Rip 'N Grip Industries, Inc.</a>	Palmdale , CA	Mfr. & Dist. Of Hook & Loop Fastening Tapes
<a href="#">American Cord &amp; Webbing Co., Inc.</a>	Woonsocket , RI	

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<u><b>Industrial Tape &amp; Supply Co.</b></u>	Marietta , GA	Complete Line Of Tape & Packaging Supplies Including 500 Varieties Of Pressure Sensitive Tapes, Tape Dispensers, Carton...
<u><b>Griff Paper &amp; Film</b></u>	Fallsington , PA	Release Liners For The Pressure Sensitive Fastener Industry. Paper & Film Substrates. Printing Logos A Specialty
<u><b>T &amp; W Converters, Inc.</b></u>	Glendale , CA	Tape Die-Cutting, Printing, Slitting, Rewinding & Laminating. In-House Printing Of Carton Sealing & Gummed Tape. Dist. Of...
<u><b>Adhesives &amp; Tapes Industrial Supply</b></u>	Vista , CA	Adhesives, Sealants, Coatings, Encapsulants, Tapes & Application Equipment. Casting Resin, Acrylic, Anaerobic,...
<u><b>Granat Industries, Inc.</b></u>	Elk Grove Village , IL	Hook & Loop (Sewing Quality - Pressure Sensitive) All Widths In Stock. Thread, Webbing, Plastic & Metal Hardware, Rivets,...
<u><b>Hang-Ups Unlimited, Div. of Magna-Pole Products, Inc.</b></u>	Santa Monica , CA	Mfrs. Of Adhesive, Magnetic & Suction Cup Hooks & Mechanical Fasteners For Hanging Promotional & Permanent Indoor Displays,...
<u><b>FASTENation, Inc.</b></u>	Passaic , NJ	Dist. & Fabricator Of Hook & Loop Fasteners, 3M Dual Lock

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<a href="#">WCL Company</a>	City Of Industry, CA	Cable Ties & Clamps; Cuff Restraints; T-Clamps; Nail Clips; Hose Clamps; Wire Ducting; Patch Panels
<a href="#">MSC Industrial Supply Co.</a>	Melville, NY	Supplier Of 450,000 Products From 2,500 Mfrs.: Cutting / Machine / Hand / Power Tools, MRO Supplies, Abrasives, Fasteners,...
<a href="#">TekSupply</a>	South Windsor, CT	Wholesale Mfr. & Dist. Serving The Agricultural, Building, Repair & Maintenance Industries. Specializing In ClearSpan™...
<a href="#">Meyers, A., &amp; Sons Corp.</a>	New York, NY	Hook & Loop, Straps, Cut Pieces. Sew On & Pressure Sensitive. Fibre Optic Bundle Straps
<a href="#">World Fasteners, Inc.</a>	Hampstead, MD	Over 195 Million Fasteners In Stock In All Materials, Sizes & Shapes. Military, Commercial, Fed-Milspec, AN-MS-NAS....
<a href="#">Seton Identification Products</a>	Branford, CT	Hook & Loop
<a href="#">Linal, Inc.</a>	Bristol, CT	Supplier & Mfr. Of Metal Snap Hooks & Snap Closures For Pet Leads, Tents, Marine, Military Specification & A Wide Range Of...
<a href="#">Nielsen / Sessions</a>	Hartford, CT	Global Mfr. Of Latches, Hinges, Handles, Locks & Hardware. Standard & Custom Engineered Applications To Industrial,...
<a href="#">Clements Industries Inc.</a>	South Hackensack, NJ	Mfrs. Of Pressure Sensitive Tape & Label Dispensers, Bag Sealers, Cable Ties, Packaging Machinery, Twist Tie Machines &...
<a href="#">Dienetics, Inc.</a>	Grand Rapids, MI	Die Cut, Stamped & Lasercut Plastic, Rubber, Foam, Cork, Fibre & Adhesive Backed Non-Metallic Materials. Mfr. Of Laser Steel...
<a href="#">Pacific States Felt &amp; Mfg. Co., Inc.</a>	Hayward, CA	Cut To Specs.
<a href="#">HellermannTyton, A Spirent Co.</a>	Milwaukee, WI	Cable Management Products Including Cable Ties, Clips, Clamps & Other Fasteners
<a href="#">Covert Co., Inc.</a>	Baltimore, MD	Mfg. Adhesive Machinery For Bonding Hook & Loop Material To Plastics & Metals
<a href="#">Gem Office Products Co., LLC</a>	Jacksonville, FL	Paper Clips, Brass & Steel Paper Fasteners, Metal Meat Skewers, Pin Tickets, Thumb Tacks, Pins, Package Handles, Specialty...
<a href="#">HyTech Spring And Machine</a>	Plainwell, MI	Flat Springs, Retainers, Snap Rings, Clamps, Rings, Wire Forms & Any Type Of Helical Springs With Size .002" & Up. Certified...
<a href="#">Converters Inc.</a>	Huntingdon Valley, PA	Specializing In Custom Slitting, Die Cutting & Laminating Of Pressure Sensitive Tapes
<a href="#">Atlantic Gasket Corp.</a>	Philadelphia, PA	Mfr. Of Gaskets, Die-Cut Parts & Fabrications From A Wide Range Of Non-Metallic Materials, Including

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<a href="#"><u>Advanced Fabricating Technology, Inc.</u></a>	Grand Rapids, MI	Die Cutting, Fabricating, Stamping, Laminating, Packaging & Screen Printing Of Plastics, Rubber, Adhesives, Foam & Fibre....
<a href="#"><u>Enco Manufacturing Co.</u></a>	Farmingdale, NY	Metaworking & Woodworking Tools, Machines & Supplies
<a href="#"><u>Diamond Fasteners, Inc.</u></a>	Farmingdale, NY	Distribute Fasteners & Electronic Hardware. In Stock Military Specs. (AN-MS-NAS), Aerospace / Aircraft Fasteners, Standard /...
<a href="#"><u>Able National Corp.</u></a>	Brooklyn, NY	Turnkey Contract Mfr. Of All Die Cut Products; Magnets, Filters, Gaskets, Washers, Advertising Specialties; Design, Printing
<a href="#"><u>Alliance</u></a>	Hot Springs, AR	Designer & Mfr. Of All Varieties Of Rubber Bands For All Applications Including Office, Home, Industry & Produce. Packaging,...

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<a href="#">Greene Rubber Co., Inc.</a>	Woburn, MA	Dist. & Fabricators Of Hook & Loop Materials. Strips Or Die Cut Parts To Specification. Dies Made On Premises
<a href="#">Leonard Industrial Supply</a>	Westbury, NY	Complete Line: Hand Tools, Fasteners, 3M Abrasives, Adhesives, Chucks, Cutting Tools (Drills, End Mills, Reamers),...
<a href="#">Century Marketing Corp.</a>	Bowling Green, OH	Plastic Hook, Tachers, Self Fastening. Hang Tags & Garment Bags Also Available
<a href="#">Deccofelt Corporation</a>	Glendora, CA	Converters Of A Wide Range Of Materials Into Adhesive Coated Products. Complete Die-Cutting & Slitting Facilities
<a href="#">Reid Tool Supply Co.</a>	Muskegon, MI	35,000 Items In Stock, No Minimum Order
<a href="#">Robbins Lightning, Inc.</a>	Maryville, MO	Mfrs. Of A Complete Line Of Lightning Protection & Static Grounding Materials Which Comply With The Requirements Of Codes...
<a href="#">A+ Products, Inc</a>	Brooklyn, NY	Stampings, Die Casted, Wire Forms, Split Keyrings, O & D Rings, Suspender, Luggage & Plastic Hardware, Zippers
<a href="#">Diversified Foam Products Inc.</a>	Pennsauken, NJ	Custom Foam Fabrication, Precision Slitting, High Speed Die Cutting, Flame Lamination, Hot Wire & Kiss Cutting. Specializing...
<a href="#">Rapid Rivet &amp; Fastener Corp.</a>	Farmingdale, NY	Master Dist. Of All Types Of Rivets, AN, MS, Commercial. Solid Semi-Tubular Blind, Drive Rivets & Rivet Nuts
<a href="#">Hudson Fasteners, Inc.</a>	Bay Shore, NY	Full Line Mfr., Dist. Fasteners: Screws, Nuts, Bolts, Washers, Hardware, Fastener Assortment Kits. All Grades, Materials &...
<a href="#">Fastening Products Inc.</a>	Laguna Hills, CA	Mfr., Distributor, Importer, & Wholesaler Of Commercial Grade Fasteners For Sale To OEM's. Standard Items Available...
<a href="#">Wayne Bolt &amp; Nut Co.</a>	Detroit, MI	Fasteners; Bolts, Screws, Nuts, Pins, Dowels, Spacers, Fittings. Standards Or Specials From Blue Prints. Ferrous Or Non...
<a href="#">FFr / Fasteners For Retail</a>	Cleveland, OH	Merchandising Systems & Accessories Including Sign Holders, Shelf Management Systems, Ceiling Display Products, Product...
<a href="#">Allied Manufacturers</a>	Corona, CA	Supplier Of Machined Components & Products. Products To Every Industry; From Designers Of Skates To Builders Of Jumbo Jets
<a href="#">P &amp; H Metal Products Corp.</a>	Valencia, CA	Mfr. Of More Than 1500 Luggage / Custom Hardware; Buckles, Hooks, Snaps, Rivets, Rings, Slides, Tie-Downs
<a href="#">Cable Markers Co., Inc.</a>	Lake Forest, CA	Identification Products, Wire Markers, Computer Printable Systems, Labels, Tags, Heat Shrink Sleeving, Serialization, Bar...

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<a href="#"><u>Ampex Metal Products Co.</u></a>	Cleveland, OH	All Materials & Industries. Four-Slide, Punch Press, Secondary Operations. CAD, SPC. Complete Tool & Die Facilities
<a href="#"><u>Brand Preference Development Co.</u></a>	St. Louis, MO	Hinges, Hardware, Locks, Latches & Foam Tape, Plastic & Metal Trim
<a href="#"><u>Astrup</u></a>	Cleveland, OH	Dists. Of Hardware For Awning, Tent & Marine Applications. Also Awning, Sign, Marine, Tarp & Tent Fabrics As Well As...
<a href="#"><u>Clip Strip Corp.</u></a>	Hackensack, NJ	Mfrs. Of Display Fixtures, Clip Strips, Holders For: Price Channels, Signs, Banners, Cards, Labels
<a href="#"><u>Advanced Cable Ties, Inc.</u></a>	Gardner, MA	Mfg. & Specializing In Nylon, Stainless Steel, & Hook & Loop Cable Ties, Cable Tie Accessories, Cable Clamps, Cable Wraps,...
<a href="#"><u>Premier Fasteners, Inc.</u></a>	Farmingdale, NY	Stocking Dist. Of Fasteners; Nuts, Bolts, Rivets, Screws, Washers, & Hardware For Commercial, Industrial & Aerospace Markets
<a href="#"><u>Associated Bag Co.</u></a>	Milwaukee, WI	Reusable Ties With / Without Buckle In Black. Self-Adhesive Velcro® Coins. Packaging & Shipping Supplies
<a href="#"><u>Allan Zipper Mfg. Corp.</u></a>	Brooklyn, NY	Nylon Molded & Metal Zippers, Hook & Loop Fasteners, Separators, Closures. Assembler / Distributor
<a href="#"><u>3M Co. / Corp. Mktg. &amp; Public Affai.</u></a>	St. Paul, MN	Serving Several Markets Including: Automotive, Communication Arts, Construction & Maintenance, Consumer, Electronics /...

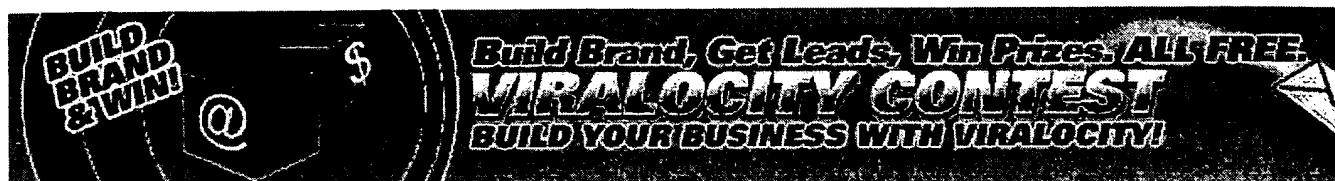
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<a href="#">Plitek, LLC</a>	Des Plaines, IL	Specialists In Custom Die Cutting, Slitting, Laminating, Coating, Spooling, Plastic Extrusion & Fabrication Of Precision...	Select companies in state/province:
<a href="#">Moore, Howard J., Co., Inc.</a>	Huntington Station, NY	Plastic & Insulating Parts & Material; Rubber Gaskets, Die Cutting, Stamping, Screw Machine Parts	Alabama Alaska Alberta
<a href="#">Secon Rubber &amp; Plastics, Inc.</a>	Red Bud, IL	3M Converter, Foam Tapes, Gaskets, Pressure Sensitive Adhesives, Diecutting, Laminating, Slitting, VHB Tapes, Converter &...	To select multiple states, press (Cmd on Macs)
<a href="#">New Brunswick Plating, Inc.</a>	New Brunswick, NJ	Plating & Surface Finishing Of Complex Components In The Electronic, Medical & Electrical Industries. Plate On A Large...	<a href="#">Narrow Search</a>
<a href="#">Crest Lock Co., Inc.</a>	Brooklyn, NY	Mfr. / Designer Of Specialty Hardware For Transit & Instrument Cases & Trunks, Cabinets, Luggage. Standard & Custom Handles,...	<a href="#">Search Again</a>
<a href="#">Wirewright Manufacturing</a>	Camarillo, CA	All Types Of Commercial, Industrial, Military Buckles. Products Include D-Rings, Medical Buckles, Plastic Buckles, Snap...	Find products and services in North American companies and industries.
<a href="#">Harper Aerospace</a>	Corona, CA	Fasteners Found In Satellites , Nuclear Applications, Radar Equipment, Turbine Engines & High-Pressure Pumps	<input type="text"/>
<a href="#">Audion Automation, Ltd.</a>	Addison, TX	Mfr. Of Flexible Packaging Systems & Packaging Machinery: Shrink Packaging, Bag Packaging & Skin Packaging. Products...	<input type="text"/>
<a href="#">Breeze Eastern</a>	Union, NJ	Rescue Hoists, Cargo Winches & Hook / Tie-Down Systems For Helicopters, Other Aircraft & Ships	<input type="text"/>
<a href="#">Textol Systems, Inc.</a>	Carlstadt, NJ	Distributor & Fabricator Of Hook & Loop Products	<input type="text"/>
<a href="#">Delafield Fluid Technologies</a>	Duarte, CA	Supplier Industrial Hoses, Including Hose Accessories & Fittings	<input type="text"/>
<a href="#">Vicar International</a>	Union, NJ	Mfrs. Of Snap Fasteners, One Way Fasteners, Baby Snaps, Curtain Fasteners, Turnbuckles, 100% Stainless Steel Snap Fasteners...	<input type="text"/>
<a href="#">Tape Specialists Of Georgia Inc.</a>	Americus, GA	Supplier & Converter Of Pressure Sensitive Tapes, Foams, Diecuts / Extrusions & Packaging Materials. Representing The...	<input type="text"/>
<a href="#">Sutherland Felt Co.</a>	Troy, MI	Mfr., Die Cutting, & Fabricating Felt, Cork, Rubber, Foam, Leather, Hi-Temp materials. Fast Turnaround, Short Runs Welcome	<input type="text"/>
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<a href="#">Warren Bolt &amp; Screw Div., Warren</a>	Detroit, MI	Mfrs. Dowel & Taper Pins, Woodruff Keys, Acorn &	<input type="text"/>

<u>Screw Works</u>		Weld Nuts, Weld Screws, Long Socket Caps, Specialty Screw
<u>Syst-A-Matic Tool &amp; Design</u>	Meadville, PA	Mfrs. Of Taplicator- Tape Application System: Feeds, Cuts, & Applies Pressure Sensitive Tape; Scrap-Eliminating Process...
<u>Richco, Inc.</u>	Chicago, IL	Plastic Fasteners, Circuit Board Hardware, Wire Routing Products, Cable Ties, Clips & Clamps, Fiber Optic &...
<u>Integrity Fasteners, Inc.</u>	Orange, CA	Dist. Fasteners, AN-MS-NAS, BAC Hardware, Inserts, Nuts, Bolts, Screws, Washers, Fittings, Connectors. Metric & Standards,...
<u>Plasti-Clip Corporation</u>	Milford, NH	Price Channel Sign Holders, Clips, Accessories
<u>D.J. Associates, Inc.</u>	Fort Smith, AR	Miscellaneous Hardware, Webbing & Tapes, Small Quantity Specialists
<u>Barjan Manufacturing Ltd.</u>	Farmingdale, NY	Hook & Loop Fastening Systems For Drapery Systems, Secure Guard™ Systems
<u>American Trade Group, Inc., Left Hand Bolt &amp; Nut Div.</u>	Detroit, MI	Large Inventory Of Finished Left-Hand Hex Head Caps, Socket Caps & Hex Nuts
<u>MULTI TRIM</u>	New York, NY	Mfrs. & Dist. Of Full Line Of Industrial Sewing & Trimming Supplies In Any Colors & Styles

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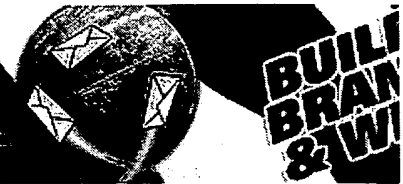
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<a href="#">Manderscheid Equipment &amp; Supply</a>	Chicago, IL	3M Hook & Loop Available	Select companies in state/province:
<a href="#">Jontay</a>	Waycross, GA	Dist. Of Webbing, Hardware, Buckles, & Notions. Plastic & Metal Buckles, Hook & Loop Elastic.	
<a href="#">Pam Narrow Fabrics Corp.</a>	Freeport, NY		
<a href="#">Suncor Stainless, Inc.</a>	Pembroke, MA		Alabama Alaska Alberta
<a href="#">Andfel Corp.</a>	Bloomington, IN	Hand Held Attaching Tool Systems To Replace Thread, Metals Staples & Pins For Fabric, Drapery & Upholstery Applications....	
<a href="#">Mil-Spec Fasteners Corp.</a>	Hampstead, MD	Over 200 Million Fasteners In Stock, All Sizes / Materials, Hard-To-Find Items Military Specifications, MS-NAS-NASM,...	
<a href="#">Ronstan International Inc.</a>	Largo, FL	Mfr. Stainless Steel Narrow, Ferrule Eye & Flared Top Eye Straps. Also, Pulleys Sheaves, Rope Cleats, Stainless Steel...	To select multiple states, press (Cmd on Macs) <input type="button" value="Narrow Search"/>
<a href="#">Norse, Inc.</a>	Torrington, CT	Latches-Spring Loaded: Surface Mounted Externally / Internally-Mortised, Sealable, Ganged & Remotely Operated	
<a href="#">Triforce Fasteners</a>	Upland, CA	Complete Line Of Fasteners: Nuts, Bolts, Screws, Rivets, Retainers For Various Applications Covering Mil-Spec, Aerospace,...	
<a href="#">Missouri Threaded Rod, Inc.</a>	St. Louis, MO	Mfr. Of Threaded Rods Studs, Bolts, Nuts, Washers, Screws In Alloys & Stainless Steel	<input type="button" value="Search Again"/> Find products and services from North American companies in various industries.
<a href="#">Stewart Handling Systems</a>	Chino, CA		
<a href="#">Quintana Industrial Supply, Inc.</a>	Lawrence, MA		
<a href="#">U.S. Slide Fastener Corp.</a>	Boston, MA		<input type="text" value="Product/Service"/> <input type="button" value="Search"/>
<a href="#">Peters-De Laet, Inc.</a>	South San Francisco, CA		
<a href="#">ATCO</a>	Houston, TX		
<a href="#">Scovill Fasteners, Inc. (DOT, PCI)</a>	Clarkesville, GA	Fasteners	
<a href="#">Komar / Stitchcraft</a>	Elk Grove Village, IL		
<a href="#">Argent Automotive Systems</a>	Novi, MI		
<a href="#">Bisco Int'l. Inc.</a>	Hillside, IL	Fasteners For Temporary & Permanent Jobs	
<a href="#">Aplix, Inc.</a>	Charlotte, NC		
<a href="#">Emar Separator Co., Inc.</a>	Long Island City, NY	Mfrs. Of Metal, Plastic, Nylon Zippers. Separators, Slide Fasteners Of All Sizes & Types	
<a href="#">Lockfast, Inc.</a>	Cincinnati, OH		
<a href="#">Lockfast-West</a>	North Las Vegas, NV		
<a href="#">CustomFab Inc.</a>	Huntington Beach, CA		
<a href="#">Royalox International, Inc.</a>	Phillipsburg, NJ		

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<a href="#">Versa-Flex Inc.</a>	Cleveland, OH	Contract Sewing, Design, Prototypes, Large & Small Runs	Select companies in state/province:
<a href="#">Schwartz, Gerald, Inc.</a>	Tucker, GA		<input type="text"/>
<a href="#">RAK Foam</a>	Cedar Knolls, NJ		<input type="text"/>
<a href="#">Creative Packaging, Inc.</a>	Tulsa, OK		<input type="text"/>
<a href="#">Fare's Industrial Tools &amp; Supply</a>	Corona, CA		<input type="text"/>
<a href="#">Magic Tape Corp. DBA Inloc</a>	Passaic, NJ		<input type="text"/>
<a href="#">Mountainview Specialties Inc.</a>	Perkasie, PA		<input type="text"/>
<a href="#">Vanguard Performance Plastics</a>	Elkhart, IN	Single & Double Coated Foam Tapes	<input type="text"/>
<a href="#">GB Vision</a>	Milwaukee, WI		<input type="text"/>
<a href="#">S.T. Robb Co.</a>	Edina, MN	Dist. Of Nuts, Bolts, & Screws. All Sizes	<input type="text"/>
<a href="#">Ozland Enterprises, Inc.</a>	Vicksburg, MI	Hook & Loop Straps & Fastening Systems: Variety Of Applications	<input type="text"/>
<a href="#">YKK (U.S.A.) Inc.</a>	Lyndhurst, NJ		<input type="text"/>
<a href="#">Popco Inc.</a>	Minnetonka, MN	Brand Adhesive Backed Hook & Loop	<input type="text"/>
<a href="#">Mikron America, Inc.</a>	Paterson, NJ	Grommets, Caps, All Button Fastening & Covering Applications	<input type="text"/>
<a href="#">Ooltewah Mfg., Inc.</a>	Ooltewah, TN	Heat Sealing, Ultrasonic Sealing. Hook & Loop Cutting, Mating, Sewing & Bonding. Strapping, Hook & Loop, Patented...	<input type="text"/>
<a href="#">Cansew, Inc.</a>	Montreal, QC		<input type="text"/>
<a href="#">Valley Enterprises, Inc.</a>	Ubly, MI		<input type="text"/>
<a href="#">Technifast Industries, Inc.</a>	Carol Stream, IL	Custom Cold-Headed Products, Specialty Fasteners, Screws, Special Items	<input type="text"/>
<a href="#">Iver Display</a>	Bangor, PA		<input type="text"/>
<a href="#">Progressive Plating Technology, Inc.</a>	Bridgeport, CT	ISO 9002 Certified. Automated Barrel Electroplating Certifying To Specs	<input type="text"/>
<a href="#">Vers-A-Flect</a>	Wilmot, NH	2", 1-1 / 2", 1", 5 / 8", Black & Navy Blue	<input type="text"/>
<a href="#">Automatic Plating</a>	Bridgeport, CT		<input type="text"/>
<a href="#">King, John, Inc.</a>	City of Commerce, CA		<input type="text"/>
<a href="#">Fastening Products Of Lancaster</a>	Lancaster, PA	Mfr. Distributor Of A Variety Of Fasteners. Standard, Metric, Military, Aerospace. All Alloys. Large Inventory. On Premise...	<input type="text"/>
<a href="#">AccuMED Technologies, Inc.</a>	Buffalo, NY		<input type="text"/>

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Company Name	Location	Description
<a href="#">Great Industries Corp.</a>	Ontario, CA	Mfr. Of Hook & Loop Tapes & Neoprene Sheet
<a href="#">Excel Thread &amp; Sewing Supply</a>	Passaic, NJ	Mfr. & Distributor Of Industrial Sewing Threads
<a href="#">Ideal Fastener Corp.</a>	Oxford, NC	
<a href="#">Valley Products Co.</a>	York New Salem, PA	Sew-In Labels, Narrow Fabrics, Cotton Or Synthetic Tapes
<a href="#">Atron Products &amp; Services</a>	Alpha, NJ	
<a href="#">Design / Craft Fabric Corp.</a>	Niles, IL	
<a href="#">Hart Industries, Inc.</a>	Owings Mills, MD	
<a href="#">Scovill Fasteners, Inc.</a>	Clarkesville, GA	
<a href="#">Grimes Industrial Products Group</a>	Toronto, ON	
<a href="#">Baron Industries, Inc.</a>	Pine Brook, NJ	
<a href="#">Consumer Care Products, Inc.</a>	Plymouth, WI	Plastic & Fabric Tape
<a href="#">JRM Industries, Inc.</a>	Passaic, NJ	
<a href="#">Kronke Co., Inc.</a>	Hayward, CA	
<a href="#">Natvar Co., A Tekni-Plex Co.</a>	Clayton, NC	Electrical Sleeving & Insulation, General Purpose & Specialized Plastic Tubing
<a href="#">Saunders Corp. Div., R.S. Hughes Inc.</a>	Glendale, CA	
<a href="#">Ward &amp; Kennedy Co.</a>	Milwaukee, WI	
<a href="#">Merlin Industries</a>	New York, NY	Hook / Loop Fasteners, Buttons, Zippers, Shoulder Pads For Apparel

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<a href="#">Velcro USA Inc.</a>	Manchester , NH	Hook & Loop Fastening Systems For Industrial Applications Where Separation & Rejoining Of Components Is Necessary, Or Where...
<a href="#">Perfectex Plus LLC</a>	Huntington Beach , CA	Hook & Loop Fasteners. Sew-On Pressure-Sensitive Tapes. Heat & Solvent Activated Tapes. Fire-Retardant. Mil. Spec. Custom...
<a href="#">National Webbing Products Co.</a>	Garden City Park , NY	Complete Line Of Thermoplastic & Metal Components For Handbags, Sportbags, Luggage, Straps, Apparel, Footwear, Belts, Auto,...
<a href="#">American Cord &amp; Webbing Co., Inc.</a>	Woonsocket , RI	Assorted Sizes & Materials
<a href="#">Levitt Industrial Textile Co.</a>	Hicksville , NY	Dist. Of Velcro® Brand Hook & Loop Tape, Coins & VELCLOTH™ Brand Display Fabric. Special Colors, Widths, Lengths, Cut...
<a href="#">Speedtech International, Inc.</a>	Chicago , IL	Mfr. & Dist. Of Hook & Loop Fasteners. Stocking VELCRO®, SPEEDWRAP® & Other Brands
<a href="#">WBC Industries, Inc.</a>	Westfield , NJ	Hook & Loop Fasteners
<a href="#">Tapeler Tape Machine Corp.</a>	Ashland , MA	Automatic Or Semi-Automatic High-Speed Tape Applicators For All Types Of Pressure Sensitive Tape With Or Without Liner,...
<a href="#">Bond Products Inc.</a>	Philadelphia , PA	Suppliers Of Narrow Fabrics, Including Woven Tapes, Hook & Loop Tape & Dots, Drawcord Braids, Webbing, Elastics, Tying...
<a href="#">Middleburg Thread &amp; Sewing Supply</a>	Warminster , PA	Sew-On, Pressure Sensitive, Heat Activated, Solvent Activated, Polyester, Cut Pieces, Fabricated Straps & Assemblies
<a href="#">Toleeto Fasteners International</a>	San Ysidro , CA	Reusable Hook & Loop Cable Ties, Wrist Bands & Custom Fabricated Straps For A Variety Of Applications. Ultrasonic Welding &...
<a href="#">Bardsco</a>	St. Louis , MO	Reusable Hook & Loop Cable Ties, Wrist Bands & Custom Fabricated Straps For A Wide Variety Of Applications. Ultrasonic...
<a href="#">Touchtape, Inc.</a>	St. Augustine , FL	Standard & PS Hook & Loop Tape & PS Dots Available. In-House Mfg. & Fabrication. Custom Orders
<a href="#">Lea &amp; Sachs, Inc.</a>	Des Plaines , IL	
<a href="#">FASTENation, Inc.</a>	Passaic , NJ	Dist. & Fabricator Of Hook & Loop Fasteners, 3M Dual Lock
<a href="#">Precision Plastics</a>	Beltsville, MD	Custom Mfr. Hook & Loop Fasteners, Made To Specs., In-House Design Assistance
<a href="#">Alliance</a>	Hot Springs, AR	Designer & Mfr. Of All Varieties Of Rubber Bands For All Applications Including Office, Home, Industry & Produce. Packaging,...
<a href="#">Brunner Manufacturing, Inc.</a>	Mauston, WI	Special Cold Headed & Formed Products For All OEM & After Market Needs. Special Bolts, Drilled

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<a href="#"><u>Blair Co.</u></a>	Elk Grove Village, IL	
<a href="#"><u>Cable Markers Co., Inc.</u></a>	Lake Forest, CA	Identification Products, Wire Markers, Computer Printable Systems, Labels, Tags, Heat Shrink Sleeving, Serialization, Bar...
<a href="#"><u>Advanced Cable Ties, Inc.</u></a>	Gardner, MA	Mfg. & Specializing In Nylon, Stainless Steel, & Hook & Loop Cable Ties, Cable Tie Accessories, Cable Clamps, Cable Wraps,...
<a href="#"><u>Allan Zipper Mfg. Corp.</u></a>	Brooklyn, NY	Custom & Stock 4-Gauge Vinyl Bags With Zipper, Snaps; For Drapes, Garments, Curtains, Comforters, Textiles
<a href="#"><u>Adhesives &amp; Tapes Industrial Supply</u></a>	Vista, CA	Adhesives, Sealants, Coatings, Encapsulants, Tapes & Application Equipment. Casting Resin, Acrylic, Anaerobic,...
<a href="#"><u>Avery Dennison, Fastener Div.</u></a>	Framingham, MA	Cable Tie Products For Wire Harnessing, Packaging, Secure Holding & Bundling Functions

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Company Name	Location	Description
<a href="#">Textol Systems, Inc.</a>	Carlstadt, NJ	Distributor & Fabricator Of Hook & Loop Products
<a href="#">Ribbon Webbing Corp.</a>	Chicago, IL	Mfrs. Of Polypropylene, Nylon & Polyester Webbing, Also Hook & Loop, Gros Grain. Webbing For All Purposes, In All Colors &...
<a href="#">MULTI TRIM</a>	New York, NY	Mfrs. & Dist. Of Full Line Of Industrial Sewing & Trimming Supplies In Any Colors & Styles, Hook & Loop Fasteners, Zippers,...
<a href="#">Converters Inc.</a>	Huntingdon Valley, PA	
<a href="#">Hope Global</a>	Cumberland, RI	Loop Attachment Strip For Automotive & Industrial Seat Builds
<a href="#">Quintana Industrial Supply, Inc.</a>	Lawrence, MA	
<a href="#">U.S. Slide Fastener Corp.</a>	Boston, MA	
<a href="#">Peters-De Laet, Inc.</a>	South San Francisco, CA	
<a href="#">ATCO</a>	Houston, TX	
<a href="#">Industrial Tape &amp; Supply Co.</a>	Marietta, GA	
<a href="#">Bead Industries, Inc.</a>	Bridgeport, CT	
<a href="#">Rip 'N Grip Industries, Inc.</a>	Palmdale, CA	

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

TENNIS RACQUET EQUIPPED  
WITH A TENNIS BALL RETRIEVER

Alice H. Howe

Filed: 09/06/00

) Art Unit: 3711  
)  
) Serial No.: 09/655,743  
)  
) Docket No.: MPH 99-46  
)

AFFIDAVIT UNDER 37CFR1.132

STATE OF WISCONSIN )  
)  
COUNTY OF LA CROSSE )

I, ALICE HOWE, being duly sworn, deposes and states as follows that:

1. I was granted an R.N. degree by St. Frances School of Nursing. I was employed as a Registered Nurse at the La Crosse Clinic from 1958 to 1969; at the University of La Crosse Health Center from 1970 to 1980; and at St. Frances Hospital from 1980 to 1995. I have been an avid tennis player and fan for more than half a century, having played tennis on tennis courts throughout the U.S.A., Mexico and Europe.
2. I devised the testing procedures used to test the efficacy of hook and loop type fasteners as reported in the Example of the captioned patent application.
3. I am also the applicant of the invention described and claimed in the above application.
4. I have read and am familiar with the Office Action of Paper No. 3, the claims as currently to be amended in the response to Paper No. 3 by my attorney, the cited references of Paper No. 3, and the rejection of claims 1-7, 9, 10 and 12 as unpatentable over 35USC103(a) over U.S. Pat. No. 4,834,393 (*Feldi*) or French Patent No. 2594037 (*Musslin*), and either in view of U.S. Pat. No. 5,077,870 (*Melbye et al*) and alleged



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applicant's admission of prior art in the specification; and the rejection of claims 8, 11 and 13-15 as unpatentable over *Feldi*, or *Musslin*, and in view of *Melbye* and applicant's admission of the prior art in his specification and in further view of U.S. Patent cited No. 4,993,712 (*Urwin*).

5. Pursuant to the request of my patent attorney, a mushroom-type strip fastener, representative of U.S. Patent No. 5,077,870 (*Melbye*), was tested under identical testing procedures as reported in the Example of the captioned patent application to determine its ability to engage and lift ordinary tennis balls from the ground. Representatives of the manufacture and patent assignee of the U.S. Patent No. 5,077,870 (*Melbye*) indicated that the loop mushroom-type strip fasteners (Dual-lock) used in this test was fairly representative of the mushroom-type fasteners of U.S. Patent No. 5,077,870. In the test, a one-foot length of the mushroom-type strip fastener was attached by its own adhesive backing to the outer edge of the shoulder of a Wilson tennis racquet. Pursuant to the test, three of the most commonly used tennis balls, namely Wilson Championship tennis ball, Dunlop Tournament tennis ball, and Penn Medalist tennis ball were tested. In each test, ten attempts were made to engage and lift each ball by firmly contacting the face of the "Dual-lock" fastener material to the felt or nap of the tennis ball.

6. In all thirty attempts of paragraph 5 above, to lift the three different types of tennis balls off the ground with the mushroom-type strip fastener of U.S. Patent No. 5,077,870 (*Melbye*), all attempts were completely unsuccessful upon all of the tested tennis balls. The "Dual-lock" mushroom-type fastener of U.S. Patent No. 5,077,870 (*Melbye*) failed to adhere, stick or attach onto any of the felt surfaces of any tennis ball in any of the aforementioned 30 test attempts.

7. It is therefore concluded that the tested mushroom-type strip fastener of U.S. Patent No. 5,077,870 (*Melbye*), when attached to the edge of an ordinary tennis racquet, is totally ineffective for retrieving ordinary tennis balls off the ground upon tangential contact as prescribed by my amended claims.



8. The physical and functional properties of the *Melbye* mushroom-type fastener do not permit it to engagingly attach or adhere to the felt surface of a common tennis ball as evidenced by the test results reported herein.

9. The mushroom-type fastener of U.S. Patent No. 5,077,870 to *Melbye* cannot engage and lift a grounded tennis ball upon tangential contact as defined by the amended claims of the captioned application.

10. It is factually incorrect to conclude that *Melbye* U.S. Patent No. 5,077,870 at column 1, lines 15-23 discloses Velcro™ and ScotchMate™ are functional equivalents as hook-and-loop fasteners or that equivalency may be extended to cover the uniquely different pre-shrunk nylon monofilament hooks of the highly specific and narrowly defined characteristics as defined by the currently amended claims.

11. The mushroom-type fastener of U.S. Patent No. 5,077,870 to *Melbye* fails to meet the claimed requirements of a series of pre-shrunk nylon monofilament hooks of:

- a) an average height of at least 1.85 mm
- b) an average diameter of at least 8.25 mil
- c) an average hook width of at least 1.0 mm; and
- d) an average hook depth of at least 0.6 mm

12. United States Patent No. 5,077,870 to the *Melbye* patent discloses and claims "a mushroom-type hook strip" having an "array of upstanding stems" and "a mushroom head at an end of the stem" as shown in Figure 1 of the *Melbye* patent which is clearly different in physical and functional characteristics from the claimed preshrunk monofilament hooks as illustrated in Figure 5 of the captioned application.

13. The mushroom headed stem of U.S. Patent No. 5,077,870 to *Melbye* patent is completely different in physical structure and function from the claimed hooked configuration and characteristics of the claimed preshrunk monofilament hooks.

14. The *Melbye* mushroom hook fasteners are neither the actual nor functional equivalent of the monofilament hooks as characterized and defined by the currently

pending claims in the captioned application as verified with the testing results reported herein.

15. For comparison purposes to the mushroom-type fastener of U.S. Patent No. 5,077,870, a monofilament as defined in claims 4-15 of the captioned application, when tested pursuant to Example 1, provided the unexpectedly superior efficacy upon tangential contact onto all three types of grounded tennis balls, as has been reported in the Example of the captioned patent applicant.

16. The above comparative test results represent a fair comparison between the claimed preshrunk monofilaments of the captioned application and the mushroom-type fasteners of U.S. Patent No. 5,077,870.

17. Further deponeth sayeth naught.

Alice H. Howe  
Alice H. Howe  
Affiant

10/18/01  
Date

STATE OF WISCONSIN     )  
                                      ) ss.  
COUNTY OF LA CROSSE    )

Personally came before me this 18<sup>th</sup> day of October, 2001,  
the above-named Alice H. Howe to me  
known to be the person who signed as Affiant who executed  
the foregoing instrument and acknowledged the same.

Sherry J. Lopez  
Notary Public

State of Wisconsin

My commission expires: May 8, 2005

**Per Alice Howe 4/9/2002**

**She spoke with Wilson Ball Co., Chicago, Illinois, who advised her as follows:**

**Tennis Ball Standard of Identity:**

- 1. Round**
- 2. Diameter of no more than 6.5 cm and no less than 6.3 cm**
- 3. Made of rubber core with two halves glued together to make the sphere.**
- 4. Injected with air pressure (12 psi)**
- 5. Must be covered with felt; yellow or green**

**(they also number the balls [1, 2, 3 or 4] for players' use and identity; and they stamp the Wilson brand name on the ball)**

## THE MAKING OF A TENNIS BALL

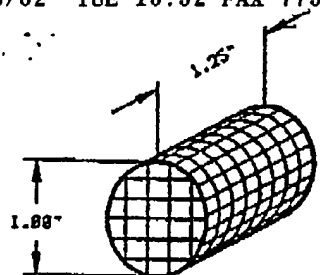
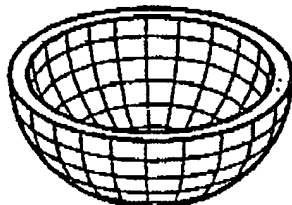
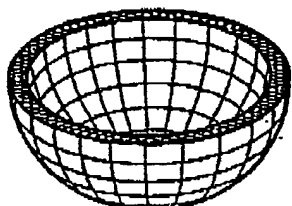
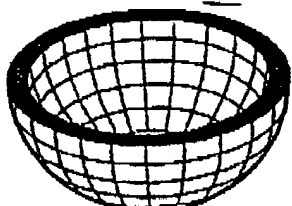
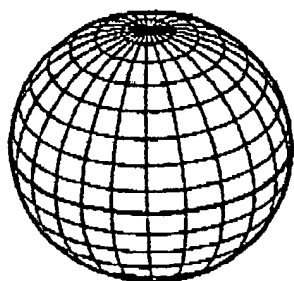
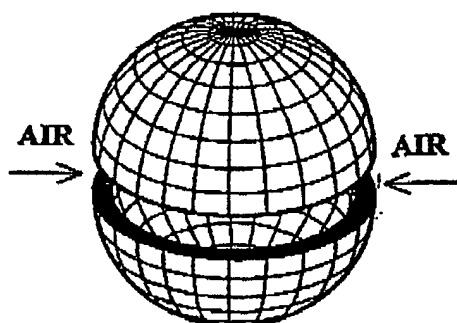
- Have you ever wondered how a tennis ball is made ?
  - Or, why there are so many different types of tennis balls ?
  - Have you ever wondered how a tennis ball got it's fuzzy, yellow cover ?
- All of these questions, and more, will be answered if you continue to read on.

### FIRST A LITTLE HISTORY :

For many years, little effort was made to standardize the construction, and performance of tennis balls. But now, the International Tennis Federation (ITF) not only specifies the size, weight, and construction of the ball, but they also specify the hardness, and resiliency ( or bounce characteristics ) of the ball. The current ITF specifications are as follows:

	Size (inches)	Weight (grams)	Construction	Hardness (inches)	Resiliency (inches)
Maximum	2.700	58.5	Fabric cover with stitchless seams	.290	58.0
Minimum	2.575	56.7		.220	53.0

Historians believe that tennis originated from the Greek, and Roman Handball Game. The ball for this game consisted of a tightly compressed cloth, covered with a lighter layer of cloth, similar to today's tennis ball. Next, came balls with wool cores, and a hand stitched leather cover. These balls were more like soft baseballs. Occasionally, these balls were manufactured with a feather core. These balls did not possess much bounce, and were significantly heavier than today's ball. In 1873, the game "Sphairistike", or Lawn Tennis was invented, and played with a lightweight, uncovered rubber ball. In England, Mr. John Heathcote, who was a real champion of tennis as we know it, found the uncovered ball too light, especially during windy play conditions. In response to this, he and his wife developed the familiar pattern of two dogbone-shaped felt panels, which would completely envelope the rubber core. For these early samples, the felt cover panels were hand stitched onto the rubber core, similar to a baseball. In the late 1920's, special adhesives were developed for attaching the felt cover to the core, thereby eliminating the stitched cover. This ball is what we now think of as a tennis ball.

**RUBBER SLUG****HALF SHELL****HALF SHELL WITH  
BUFFED SEAM****HALF SHELL WITH  
SEAM ADHESIVE****BONDED CORE****HOW A TENNIS BALL IS MADE :**

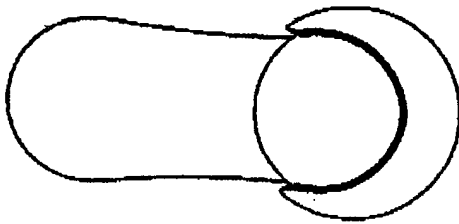
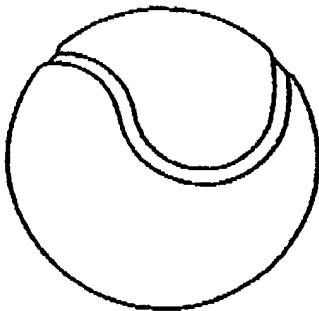
**STEP #1 – Making the Pressurized Core :** When Wilson Sporting Goods manufactures a tennis ball, they begin with the finest rubber, and premium quality ingredients available. These ingredients are first mixed with precision in a large rubber mixer, to produce a superior rubber compound. Next this compound is extruded, and cut into cylindrical - shaped slugs, measuring about 1" in diameter, and 1.25" long.

Each slug is then placed into a press, where it is molded, under heat, and pressure, to form a half shell, which will become one half of a finished core.

When the half shells are removed from the press, each hemisphere has a thin web of rubber around the entire perimeter of the half shell, which is called flash. This flash is removed in a precision stamping press, which trims away the unwanted flash. The seams of these trimmed half shells are then buffed, using a sandpaper buffing disc, and then coated with a special, high - strength seam adhesive.

An equal number of these half shells are then carefully placed into a special press, so that each pair of half shells have their buffed, and cemented seams, facing each other. Just before the press closes, a precise amount of air pressure ( approx. 15 psi ) is introduced into the small chamber between the mated half shells. Once the pressure stabilizes within the chamber, the press closes completely, thereby, trapping the air pressure within the core. This air pressure provides the tennis ball it's lively bounce characteristics. Under heat and pressure the two half shells are bonded, or vulcanized, together. We now have a pressurized tennis ball core.

These cores are then tumbled in a large, sandpaper - lined drum to roughen the surface of the core, in preparation for the application of core coating adhesive. These abraded cores are then dipped into a special core coating adhesive, and dried to the proper consistency, so that the adhesive becomes tacky, and ready to receive a felt cover. This adhesive will provide a strong bond between the core, and cover.

**FELT DOGBONE****BALL COVERING****FINISHED BALL****LOGOED BALL**

**STEP #2 -- Preparing the Felt Dogbones :** The other piece of the puzzle is the felt. Felt is a fabric, composed of primarily high grade wool, and nylon. It arrives at the Wilson Factory in large rolls, at which time it is checked for thickness, weight, color, and wear properties before processing into dogbones.

The first step in preparing the felt is to apply adhesive to the backside of the felt. This is accomplished in a large machine which coats the entire roll of felt, in a continuous process. This machine also dries the felt sufficiently so that the felt may be re-rolled at the end of the machine. This adhesive will make sure the felt does not separate from the core during play.

Next, these adhesive coated rolls of felt are fed into a machine which cuts the felt into the familiar dogbone shaped panels. The dogbones are then stacked into clamping fixtures, and squeezed in compression, for the next operation. Two dogbones are required for each finished ball.

The packs of felt dogbones, held in the clamping fixture, are then dipped into a tank containing a very special adhesive, which coats only the edges of the felt dogbones. This adhesive will eventually become the familiar white, curvy seam of the tennis ball. After drying to the proper degree, the felt dogbones are then "picked" from the dipped packs, and placed into a ball covering machine, where they meet one of the adhesive coated rubber cores, from Step #1. The ball covering machine precisely places the two felt dogbones onto the rubber core.

This is not yet a finished tennis ball. The covered balls are then placed into a final molding press, where heat, and pressure bond the covers to the core, and also form the familiar white seam of the ball. When the balls leave this final molding process, the felt on the balls is in an extremely compressed state, from the heat and pressure of the press. The felt is fluffed back to it's original form in a large industrial dryer. Initially, steam is introduced into the fluffer to loosen up the felt fibers, and allow the fibers to spring back to their original position. Finally, the fluffer dries the balls using hot, circulating air, similar to a clothes dryer at home.



We now have a finished tennis ball. These balls are next inspected for conformance to Wilson's rigid quality standards, and if found acceptable, will be stamped with the familiar "Wilson" logo. Just before the application of the logo, each ball must pass a compression test, which assures that the ball has the proper air pressure.

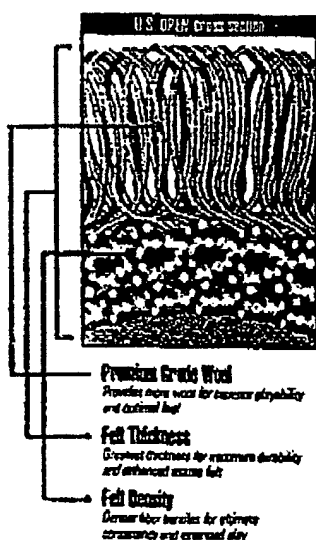
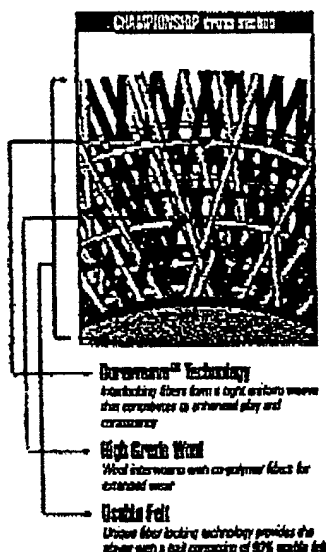
The finished balls are then placed into recyclable plastic cans, pressurized to the proper can pressure, and sealed with an aluminum, EZ Open lid. Each can is tested to insure that it is properly pressurized, and sealed. Lastly, a plastic overcap, and label are placed on the cans, and the cans are placed into cardboard boxes, ready for shipment to our customers.

#### TYPES OF TENNIS BALLS :

You may still be wondering why there are so many different types of tennis balls. There are two major categories of tennis balls — Pressurized, and Pressureless. The majority of tennis balls sold today are Pressurized Products. These products are packaged in a specially designed pressurized container, which keeps the balls fresh for years, until the can is opened, and the seal is broken. Pressurized tennis balls are more lively than Pressure-less balls, and feel lighter off the racket.

Pressureless tennis balls are manufactured with a thicker rubber wall, and with no internal ball pressure, which makes them play slower, and feel heavier off the racket. On the positive side, because there is no internal air pressure to lose, Pressureless tennis balls maintain their bounce characteristics better than pressurized balls, over the life of the ball.

Two other tennis ball products are the High Altitude Ball, and the Grass Court Ball. These two products are specially designed for specific playing conditions. The High Altitude Ball is made with a slightly lower air pressure than the Standard Wilson Ball, to compensate for the slightly lower barometric pressures found at altitudes above 3,500 feet. This change insures that the High Altitude Balls bounce correctly at higher altitudes. The Grass Court Ball features specially treated white felt that is ideal for grass court play.





PURE  
NATURAL  
RUBBER



PRECISION  
ENGINEERED  
CORE



SUPERIOR  
WOVEN  
FELT



OVER 20,000  
DAILY QUALITY  
CHECKS



OFFICIAL BALL  
OF THE U.S. OPEN



Tennis balls are also categorized by the type of felt used to produce the balls. The first type of felt, called woven, is typically made from a combination of wool, and nylon fibers, woven together in a large textile loom. The woven fabric is subjected to a large number of secondary operations, which remove the woven pattern, and provide the familiar "felt" look of a tennis ball. This type of felt is used on the Wilson U.S. Open Products.

Duraweave Felt was developed by Wilson, using a high grade wool that is uniquely interlocked with copolymer fibers to form a tight uniform weave. This construction provides a long lasting felt, which enhances the playing characteristics, and consistency of the ball. This type of felt is used on the Wilson Championship Products.

Each of the felts described above support two different levels of play – Extra Duty and Regular Duty. Extra Duty Felt is designed for play on abrasive surfaces where the fibers must withstand the shearing, and cutting action of abrasive courts. This felt does not normally fluff excessively, although high humidity, or hitting the ball with a great deal of spin may cause Extra Duty Felt to fluff more than normal.

Regular Duty Felt is designed for soft, smoother court surfaces, and indoor courts. The increased moisture of clay, or grass courts, and the high level of static electricity found in indoor courts will cause the felt to fluff more than normal. In addition, smooth court surfaces will pull, and tug at a felt (rather than the shearing, and cutting action associated with abrasive courts), causing more fluff on the felt. Therefore, it is crucial that Regular Duty Felt be designed to be highly resistant to fluffing.

So that is the story of why there are so many different types of tennis balls, and how they get their fuzzy covers. The yellow colored felt was introduced in the early '70's to improve the visibility for the players and the TV audience. From the finest raw materials, highest quality felts, and meticulous control of manufacturing processes, comes the "Wilson U.S. Open Ball... the Tennis Ball as Tough as the Tournament".



## **TENNIS BALLS FUN FACTS**

Wilson is rated as the best playing ball in tennis by over four hundred top tennis players.

### **THE BEST PLAYERS PICK WILSON AS THE BEST BALL!**

Wilson is the ball purchased most often by the best tennis players.

Wilson is the only ball used at all USTA National Championships.

Wilson is the only ball used by the WTA-The Women's Tennis Association

Wilson is the official ball of the US Open since 1979.

Wilson tennis balls are sold throughout the world including France, Germany, England, Japan, Singapore, Hong Kong and Latin American countries.

With the consistent quality, innovation and performance Wilson delivers, it has become the standard of play for an industry.

**Wilson, the Number One ball**

## **PUTTING IT ALL TOGETHER**

### **Wilson Tennis Ball Manufacturing Fact Sheet**

The first step in making a tennis ball is to prepare and mix together the ingredients that make the ball's core. The core of a tennis ball includes approximately 14 different materials. #1 is natural rubber. The tennis core stock undergoes extensive quality control testing throughout the blending process to ensure consistency.

This rubber is then made into thick sheets, milled, and then a machine punches out "slugs" which are cylindrical shaped chunks of rubber that are all the same size and shape. This "slug" is then molded into a perfectly shaped hemisphere under controlled curing conditions of time, temperature and pressure (referred to as first cure). These curing conditions are continuously monitored in order for the half shell to meet our specific requirements.

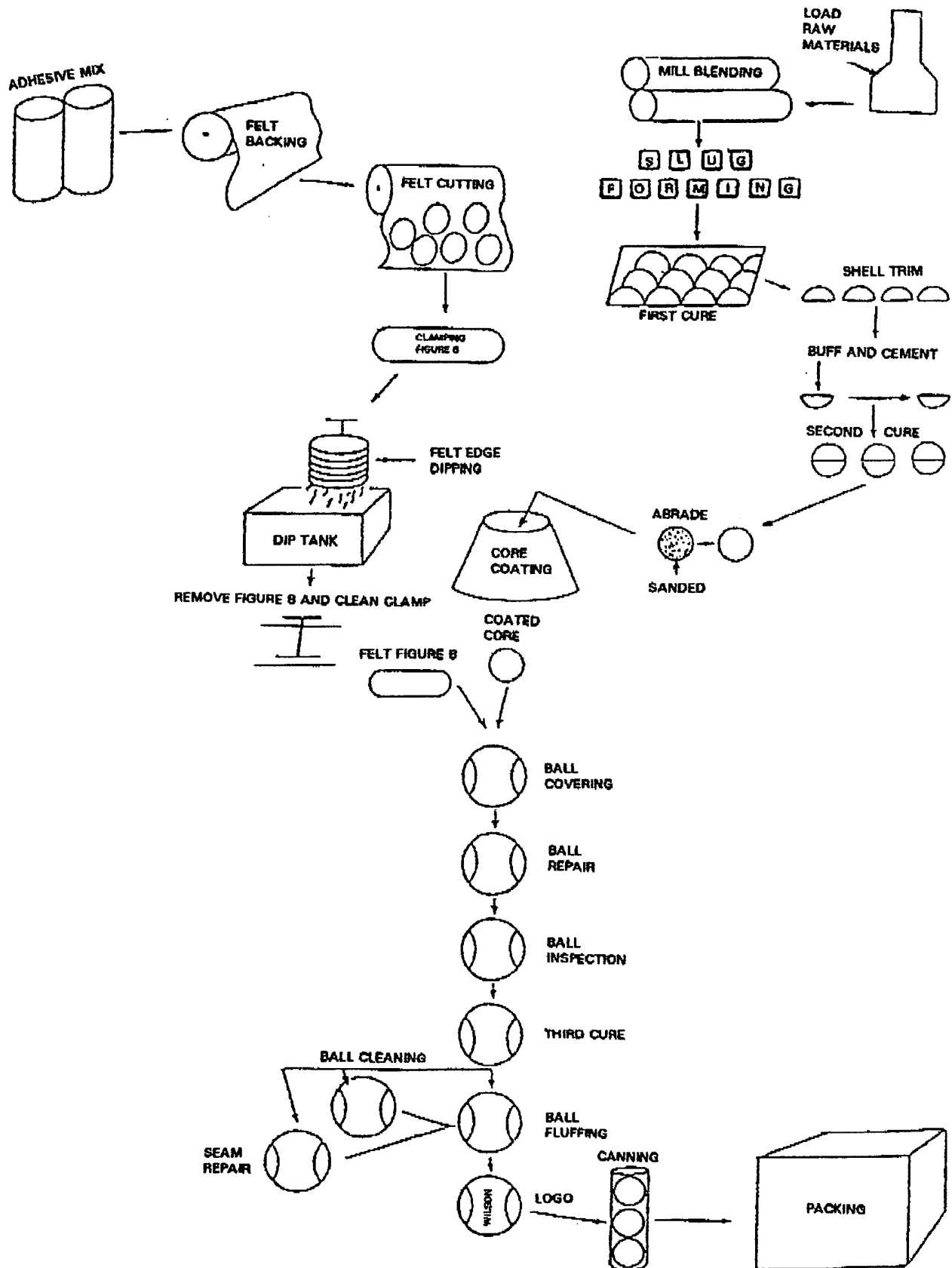
Each half shell is then buffed to even true the edges and prepare them for the adhesive that is used to bond the two halves together. The half shells are loaded into the top and bottom of a machine that looks like a waffle iron or an egg carton and they are cured here under controlled time, temperature and pressure. The inner chamber is pressurized so that the air trapped inside as the halves are fused together is at the same pressure (referred to as second cure). The adhesive on the half shell edges fuses the two half shells together for a tight seal. The pressure of each of our second cure presses are constantly monitored to ensure consistency of the core.

QC will then sample cores to test them for weight, size, rebound and deflection. The surface of the cores will then be abraded (roughened) in preparation for adhesion of the felt strips. The core is then dipped in a high quality adhesive compound and oven dried in preparation for the cover application.

A mix of specifically designed fibers are processed together to form rolls of felt material. These rolls are then "back coated" with a specially designed adhesive. Several rolls of back coated felt are fed into an automated high-speed cutting machine which punches out the figure 8 shaped pieces of felt and packs them together into a bundle. The felt packs are then dipped into a vat of white seam adhesive which coats only the edges of the felt. The felt packs are dried and the figure eights are then separated. The back coated figure eights are now inserted into the felt covering machine and placed on the core. At this point, the product starts to resemble a tennis ball. The final cure insures a perfect bond between the ball and cover. Under conditions of time, temperature and pressure, the felt is bonded to the core and the seam adhesive is cured (referred to as third cure). Extensive quality control checks are conducted throughout this entire process to assure a high quality finished product.

After third cure, the balls are steam fluffed to raise the nap on the felt, giving the balls their fuzzy appearance. After the fluffing process, the balls are visually inspected for cosmetic quality. Next comes the stamping of the company logo and number. The logo operation is also systematically controlled in order to maintain the proper positioning. QC will then sample finished balls and test them to assure that they meet USTA and player specifications. Three balls are sealed in air tight pressurized cans. The pressurized can keeps the ball pressurized for excellent bounce and playability.

## FLOW CHART



# USTA TENNIS BALL SPECIFICATIONS

## APPENDIX

### RULE 3

#### BALL - SIZE, WEIGHT AND BOUND

<sup>1</sup> The ball shall have a uniform outer surface and shall be white or yellow in color. If there are any seams they shall be stitchless. The ball shall be more than two and a half inches (6.35 cm) and less than two and five-eighths inches (6.67 cm) in diameter, and more than two ounces (56.7 grams) and less than two and one-sixteenth ounces (58.5 grams) in weight. The ball shall have a bound of more than 53 inches (135 cm) and less than 58 inches (147 cm) when dropped 100 inches (254 cm) upon a concrete base. The ball shall have a forward deformation of more than .220 of an inch (.56 cm) and less than .290 of an inch (.74 cm) and a return deformation of more than .350 of an inch (.89 cm) and less than .425 of an inch (1.08 cm) at 18 lb. (8.165 kg) load. The two deformation figures shall be the averages of three individual readings along three axes of the ball and two individual readings shall differ by more than .030 of an inch (.08 cm) in each case. All tests for bound, size and deformation shall be made in accordance with the regulations in the Appendix hereto.

<sup>1</sup> The Official USTA Yearbook and Tennis Guide With The Official Rules, H.O. Zimmerman, Inc., 156 Board St., Lynn, MA, 01901, 1977, pp. 415.

## TENNIS BALLS

### DIFFERENCES BETWEEN PRESSURIZED & PRESSURLESS TENNIS BALLS

1. Pressurized balls have traditionally been the ball of choice in this country. This preference for pressurized is based on the following:
  - They are typically more lively than pressureless and feel lighter off the racquet.
  - Pressurized balls typically sound a little crisper when hit.
  - Pressurized balls (in this country) are very inexpensive. In 1930, a can of 3 Wilson tennis balls could be purchased for \$1.50 in a Sears & Roebuck catalogue. Over sixty (60) years later, that same can of balls may be purchased for under \$2.00. With this low price, a large majority of players open a new can of tennis balls at every outing.
2. Pressurized balls are packaged in specially designed pressurized containers which are capable of keeping the balls fresh for years in storage. However, once the seal of the can is broken and the pressure is released, the balls will begin to lose air and, therefore, liveliness. The rate at which this occurs is a function of the following:

**TEMPERATURE:** The higher the temperature, the faster the balls will lose air (liveliness). For example, at room temperature a ball would typically lose approximately 2 psi of air pressure in a 2-month time period. This would result in a 2 inch loss of rebound height (liveliness) which a good player could potentially notice.

At elevated temperatures, such as 100° F, this loss of air pressure would occur much faster - probably 2 weeks instead of 2 months. For this reason, it is not a good idea to store opened tennis balls in the trunk of your car during the hot summer months. We recommend storing the balls at a cool temperature, even a refrigerator, if you have the room.

**USAGE:** Although we don't have any hard data to substantiate this claim, we do believe balls lose air much faster when they are used in play. The impact with the racket and court during play heat up the balls, resulting in a higher internal pressure and, consequently, a higher permeation rate.

3. In sharp contrast to the above, pressureless tennis balls have no internal pressure inside the core. Therefore, they will not lose liveliness over time. This provides more consistent performance over time. The most frequent complaint about pressureless balls is that they are slow playing and feel heavy on the racket. The Wilson "advantage" tennis ball is specially formulated to eliminate this heavy feeling on the racquet. Additionally, its slightly slower playing characteristics make it ideal as a practice ball since it provides a little extra time to prepare for shots. Pressureless balls are ideal for ball baskets since they don't lose air pressure (liveliness) over time. In areas of the world where tennis balls cost 2-3 times more than in the US, pressureless balls enjoy a significant market share. They represent an excellent value to the cost conscious consumer.

## **EFFECTS OF TEMPERATURE ON THE REBOUND HEIGHT OF A TENNIS BALL**

### **ITEMS TESTED**

**6-Wilson T1001 Championship Extra Duty tennis balls**

### **TEST PROCEDURE**

- 1. Balls were kept overnight at room temperature and measured for 100" rebound height the next day.**
- 2. Balls were placed in a refrigerator overnight at a temperature of 38°F. The next morning, one ball at a time was removed from the refrigerator and measured for rebound height as quickly as possible.**
- 3. Balls were placed in an oven at 100°F for 6 hours. It is important to note that the balls were placed inside a small cardboard box to prevent the hot oven air blast from impinging directly on the balls. After 6 hours, one ball at a time was removed from the oven and measured for rebound height as quickly as possible.**
- 4. Step #3 was repeated at an oven temperature of 130°F.**

### **TEST RESULTS**

**The results on the 6 tennis balls tested were averaged and plotted as a function of temperature. The results may be found in Graph 1 attached.**

### **DISCUSSION OF RESULTS**

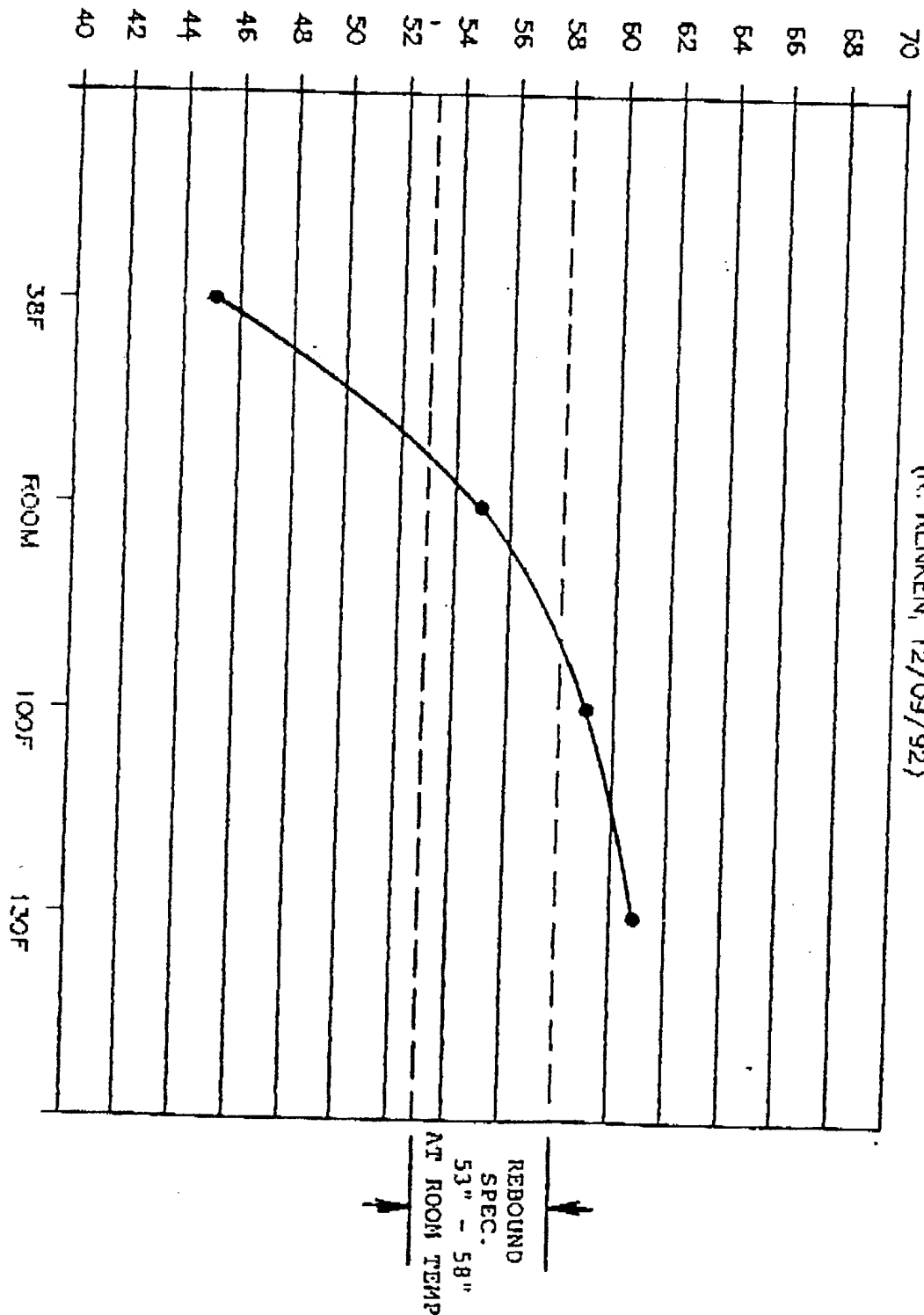
- 1. Temperature was found to have a strong influence on rebound height.**
- 2. Rebound height was most effected at the lower temperature of 38°F. On average, the balls lost 10 inches of rebound in going from 72°F to 38°F. It is important to note that if the balls at low temperatures were used in play, they would quickly increase in rebound height because of the warming of the balls due to flexing of the core.**
- 3. The balls quickly fell out of the rebound specifications of 53" - 58" when exposed to the 3 test temperatures.**

REBOUND FROM 100" DROP, Inches

**GRAPH 1**

**REBOUND HT VS TEMPERATURE**

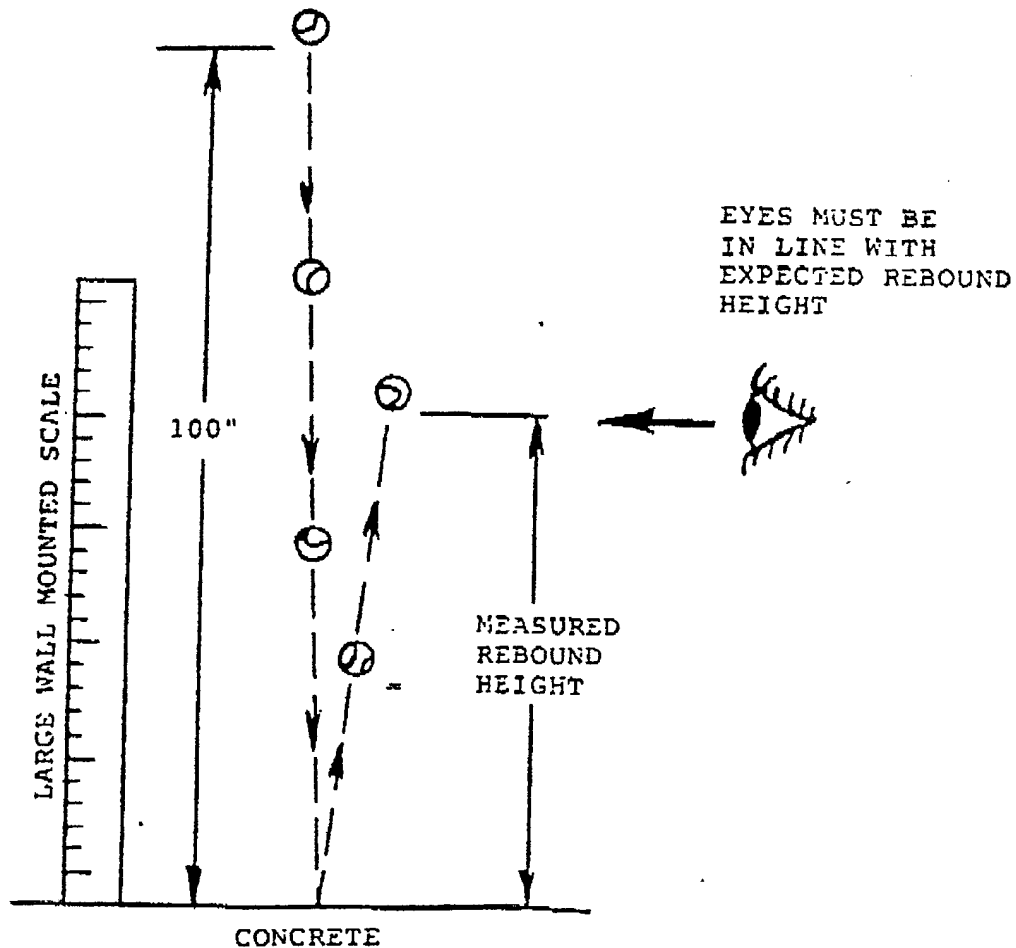
(R. RENKEN, 12/09/92)





## 100" REBOUND HEIGHT TEST

1. Balls were dropped from 100" (as measured from the bottom of the ball) onto a solid base, preferably concrete or granite.
2. Rebound height is measured to the bottom of the ball using a large graduated scale mounted behind the ball.
3. Care must be taken to assure that the eyes of the tester are in line with the approximate rebound height of the ball.
4. Three readings must be taken for each ball, and the average of the three is recorded as the rebound height.



## PERMEABILITY OF TENNIS BALL CORES

The can is pressurized (not vacuum) with approximately 12 LB/IN<sup>2</sup> pressure to maintain the pressure in the ball. Once the can is "popped", and pressure is released, the balls will lose air pressure at a slow rate, similar to a car tire losing air. Below is a test report showing the change in "Rebound Height" and "Deformation" as a function of time (or days out of the can). As you will notice, the balls lose rebound height (bounce) and become softer. The air pressure leaks through the microscopic pores in the wall of the rubber core.

### PERMEABILITY TEST OF TENNIS BALL CORES

#### ITEMS TESTED:

Twelve (12) Wilson Extra Duty tennis balls made with the following compounds:

>  
>  
>

*Confidential*

#### TEST PROCEDURE

Each group of balls were tested initially right out of the can for rebound and deformation. The balls were then placed in the lab conditioner at the standard test conditions of 68°F and 60% Relative Humidity. The balls were then re-tested every two (2) days for three (3) weeks. After 27 days, the balls were re-tested every seven (7) days. After 41 days the balls were re-tested every thirty (30) days. The balls were out of the can for a total of 196 days when the test was discontinued.

#### TEST RESULTS & CONCLUSIONS

The following table lists the rebound and deformation mean and standard deviation for the various compounds over a number of days out of the can:

This data has been plotted and curve fitted by computer using linear regression formula. The coefficient of determination ( $R^2$ ) and the individual predication equations are given in the following table:

REBOUND		DEFORMATION	
$R^2$	$\hat{Y} = A + Bx$	$R^2$	$\hat{Y} = A + Bx$
0.948	$Y = 55.81 \pm 0.034x$	0.984	$Y = 0.2731 + 0.00031x$
0.975	$Y = 55.31 \pm 0.032x$	0.979	$Y = 0.2371 + 0.00028x$
0.969	$Y = 55.06 \pm 0.036x$	0.984	$Y = 0.2320 + 0.00028x$
0.972	$Y = 56.36 \pm 0.038x$	0.974	$Y = 0.2393 + 0.00026x$

What happens to the rebound of tennis balls once they are removed from the pressurized can?

- > The rebound of all tennis balls decreases over time once they are removed from the can; this is due to pressure loss. The rebound loss, however, is only 0.032" to 0.038" a day.

- Based on a 5" difference between the 58" upper spec and 53" lower spec for rebound, it would take approximately 131 to 156 days for these balls to lose 5" in rebound at 68°F and 60% Relative Humidity.
- The rate of rebound loss at 68°F and 60% Relative Humidity varies from compound to compound. Based on the slopes of these lines, the compounds can be ranked in order of least amount of loss in rebound:

- Least 1.  
2. *Confidential*  
3.  
Most 4.

What happens to the deformation of tennis balls once they are removed from the pressurized can?

- All tennis balls soften over time once they are removed from the can; this is due to pressure loss. The amount of softening, however, is only 0.00026" to 0.00031" a day.
- Based on a 0.060" range for the deformation specifications of 0.220" to 0.280", it would take 194 to 231 days for these balls to soften 0.060" at 68°F and 60% Relative Humidity.
- Based on the slope of the linear regression lines, the compounds may be ranked in order of least amount of softening at 68°F and 60% Relative Humidity:

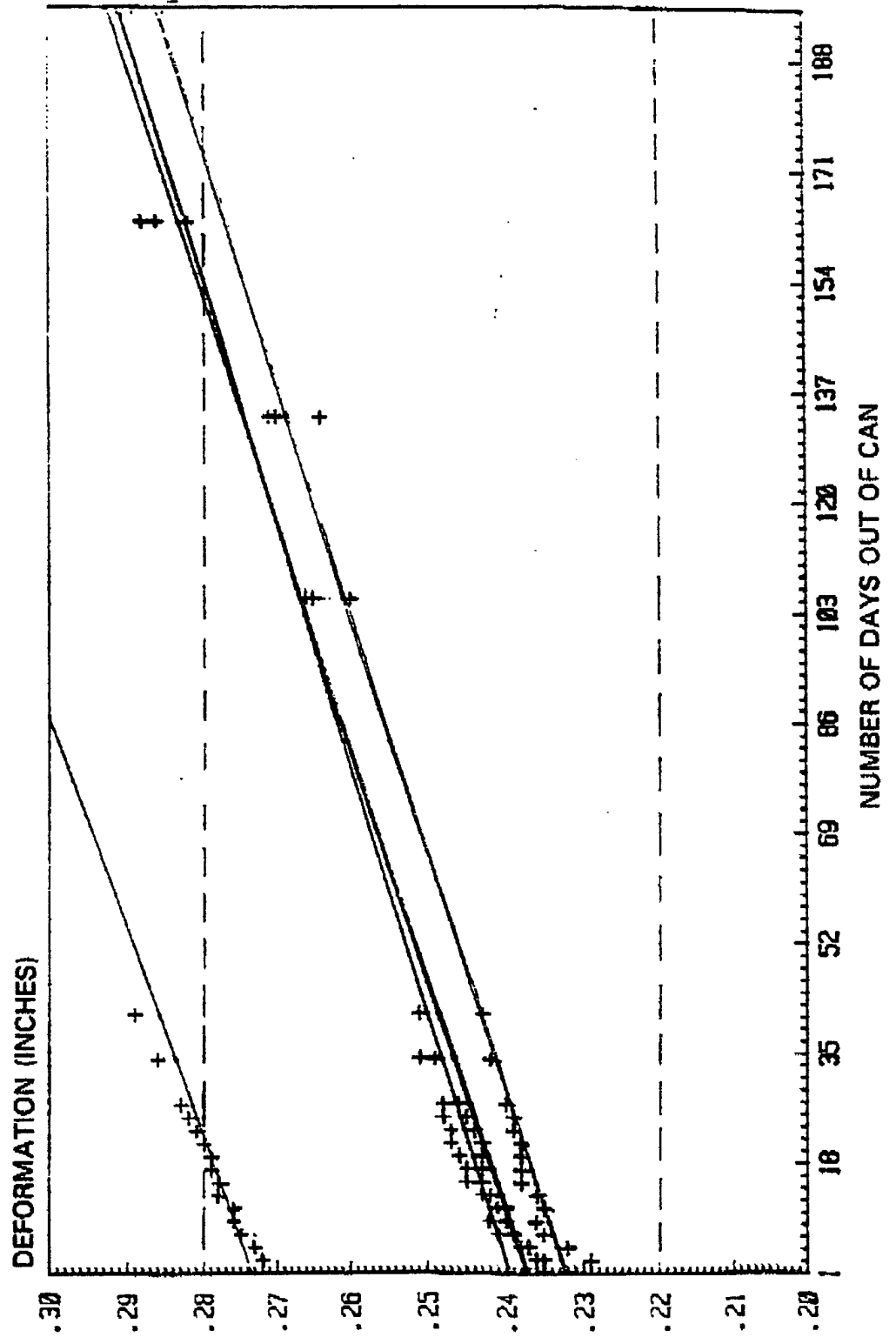
- Least 1.  
2. *Confidential*  
3.  
Most 4.

### SUMMARY

It is important to note the initial rebound and deformation of each compound. Compounds that have a rebound near the upper limit (58.0") will remain "in spec" longer than balls that are near the median (55.5") or the lower limit (53.0"). The same discussion applies to deformation; balls that are near the "hard" side of the specification (0.220") will remain "in spec" longer than balls that are nearer the specification median (0.250").

This test does not accurately measure the life of tennis balls because, in reality, balls are taken out of the can, played and then allowed to sit in non-pressurized cans at various temperatures. The actual play time and amount of hitting will accelerate the changes in rebound and deformation. At best, this test can be used to determine how long a tennis ball is playable once the can has lost its pressure.

# **LEAKAGE TEST - 68°F** (LINEAR REGRESSION)



# WEBSTER'S NEW UNIVERSAL UNABRIDGED DICTIONARY

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SYMBOLS, AND FORMS OF ADDRESS

ILLUSTRATED THROUGHOUT

Dorset & Baber

xii

xiii

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F-1

# felicitate

made very happy. [Obs.]  
 felicitated, *pl.*, *pp.*; felicitat-  
 felicitatus, *pp.* of felicitare, to  
 from *felix* (-icis), happy.]  
 happy. [Rare.]  
 felicitate; to wish joy or pleasure  
 felicitate our friends on good for-

congratulation.  
 1. suitable to the occasion;  
 2. apt and to the point; as, a

knack of appropriate and  
 felicitous occasion, style, etc.  
 felicity; as, a felicitous occa-

timely, apropos, successful,  
 felicitous manner;  
 felicity, the state or condition of

felicitous, [ME. *felicitus*;  
 from L. *felicitas*, happiness, from  
 happy.]

perfect content and comfort;  
 after this life to attain ever-  
 felicity. —Common Prayer.

which produces happiness or  
 source of satisfaction; as, the  
 felicitous life.

felicitous can genius attain than  
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 Johnson.

of appropriate and pleasing ex-  
 pression, speaking, painting, etc.  
 felicitous thought.

felicitous belonging to the cat fam-  
 from L. *felis*, properly *felis*, a cat,  
 felis, a family of the cat kind, a family of  
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from *falaha*, to cleave the soil. plow.] a peas-  
 ant or laborer in Egypt or some other coun-  
 tries where Arabic is spoken.

fell, *pl.*, *pp.*; from L. *fellatus*, *pp.* of  
 fellare, to suck.] a sexual activity involving  
 oral contact with the male genitals.

fell'er, *n.* a fellow; a man or boy. [Slang or  
 Dial.]  
 fell'er, *n.* 1. one who hews or knocks down; a  
 device for cutting down trees.

2. a sewing-machine attachment for felling  
 seams.  
 fell'fare, *n.* see *fieldfare*.

fell'mōn-gēr, *n.* a dealer in fells or hides.  
 fell'ness, *n.* cruelty; fierce barbarity; rage;  
 absolute ruthlessness.

fel'lōe, *n.* same as *felly*.  
 fel'lōw, *n.* [ME. *felow*, *felaghe*, a companion,  
 partner, from Ice. *felagi*, a partnership, fel-  
 lowship; *fe*, property, and *lag*, a laying to-  
 gether, fellowship, from *leggja*, to lay.]

1. originally, a person who shares; partner  
 or accomplice; hence, a companion; an asso-  
 ciate; a comrade; a mate.  
 In youth I had twelve fellows like myself.

—Ascham.  
 2. an equal; a person of the same class or  
 rank; peer.

3. either of a pair of similar things used to-  
 gether and suited to each other.  
 4. (a) a man or boy; often in familiar ad-  
 dress; (b) a person; one; as, a fellow must eat.

[Colloq.]  
 A fellow of infinite jest, of most excellent  
 fancy.  
 5. (a) a person of a lower social class; (b) a  
 coarse, rough man. [Obs.]

Worth makes the man, the want of it the  
 fellow.  
 6. a suitor; beau. [Colloq.]

7. a graduate student who holds a fellow-  
 ship in a university or college.  
 8. a member of a learned society.

9. a member of a governing body of a col-  
 lege, as at Oxford University. [Brit.]  
 fel'lōw, *a.* having the same ideas, position,  
 work, etc.; in the same condition; associated;  
 as, fellow workers, fellow students.

fel'lōw, *v.t.*; followed, *pp.*, *pp.*; following, *pp.*  
 1. to suit with; to pair with; to match.  
 2. to associate with; to accompany. [Obs.]

fel'lōw com'mōn-ēr, 1. one who has the  
 same right of common.  
 2. in Cambridge, Oxford, and Dublin, an  
 undergraduate who commons or dines with  
 the fellows.

fel'lōw-craft, *n.* the second degree in Free-  
 masonry; also, one who has taken this degree.  
 fel'lōw-feel', *v.t.* to have a like feeling, as sor-  
 row or joy, with; to feel sympathy with.

[Rare.]  
 fel'lōw feel'ēr, one who shares another's feel-  
 ings; one who feels sympathy for another.  
 [Rare.]

fel'lōw feel'ing, a feeling of fellowship or joint  
 interest; sympathy.  
 fel'lōw-less, *a.* having no equal or associate;  
 peerless; unmatched.

fel'lōw-like, *a.* like an associate or comrade;  
 companionable; on equal terms. [Obs.]  
 fel'lōw-ly, *a.* fellowlike; sympathetic. [Rare.]

fel'lōw sēr-vānt, each of two or more persons  
 who perform similar tasks for the same em-  
 ployer; an employer cannot ordinarily be held  
 liable for injuries suffered by one servant  
 through the negligence of another.

fel'lōw-ship, *n.* 1. the condition of being an  
 associate; mutual association of persons on  
 equal and friendly terms; communion; com-  
 panionship; familiar intercourse; intimate fa-  
 miliarity.

Have no fellowship with the unfruitful  
 works of darkness.  
 Men are made for society and mutual fel-  
 lowship.

2. a mutual sharing, as of experience,  
 activity, interest, etc.; partnership; joint  
 interest; as, fellowship in pain.

3. a group of companions or fellows; an  
 association of persons having the same tastes,  
 occupations, or interests; a band; a company.  
 The great contention of the sea and skies  
 Parted our fellowship.

4. an endowment, or a sum of money paid  
 from such an endowment, for the support of a  
 graduate student in a university or college.  
 5. the rank or position of a fellow in a uni-  
 versity or college.

fel'lōw-ship, *v.t.*; fellowshipped, *pl.*, *pp.*; fel-  
 lowshipping, *pp.*; to associate with as a fellow  
 or member of the same church; to admit to

fellowship, specifically to Christian fellow-  
 ship; to unite with in doctrine and discipline.  
 fel'lōw-ship, *v.i.* to become associated with  
 others, especially in the same church.

fel'lōw trav'el-ēr, a nonmember who supports  
 or approves the cause of a party, especially  
 the Communist Party.  
 fel'ly, *adv.* [ME. *felly*, *felli*, *fellich*, fiercely,  
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**APPENDIX  
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- b. In re Azoplate Corporation v Silverlith, Inc. 180 USPQ 616
- c. In re Sernaker, 702 F.2d 989 994 USPQ 1 (Fed. Cir. 1983)
- d. In re Vaeck, 947 F.2d 488, 20 USPQ 2nd 1438 (Fed. Cir. 1991)
- e. M.P.E.P. 2144.05 (2100-100, Rev 1, Feb 2000)
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- h. In re Freeman and Burden 177 USPQ 139 (CCPA 1973)
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- j. In re Sernaker, 702 F.2d 989, 994 USPQ 1 (Fed.Cir. 1983)
- k. In re Waymouth and Koury 182 USPQ 290
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- n. In re Lunsford 148 USPQ 721 (CCPA 1966)
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- p. In re May and Eddy 197 USPQ 606
- q. In re Soni 54 F3d 746, 34 USPQ2d 1684 (Fed. Cir. 1995)
- r. In re Nolan 193 USPQ 641 (CCPA 1977)
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- f. In re Pye and Peterson 148 USPQ 426 (CCPA 1966)
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- b. Ex parte Price, Walsh and Hallett
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- d. Ex parte Horst, in re Lange 844 O.G. 1168
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- c. Ex parte Berins 168 USPQ 374
- d. M.P.E.P. 2143.03 (2100-100, Rev 1, Feb 2000)
- e. M.P.E.P. 2144.05 (Col. 1, first complete paragraph, Page 2100-97, Rev 1, Feb 2000)
- f. Ex parte Kuhn 132 USPQ 360
- g. In re Fay et a. 146 USPQ 47

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- e. M.P.E.P. 2144.05 III (Col. 2, Paragraph 2, 2100-107, Rev 1, Feb 2000)
- f. M.P.E.P. 2145 2,23 (2100-123, Rev 1, Feb 2000)

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